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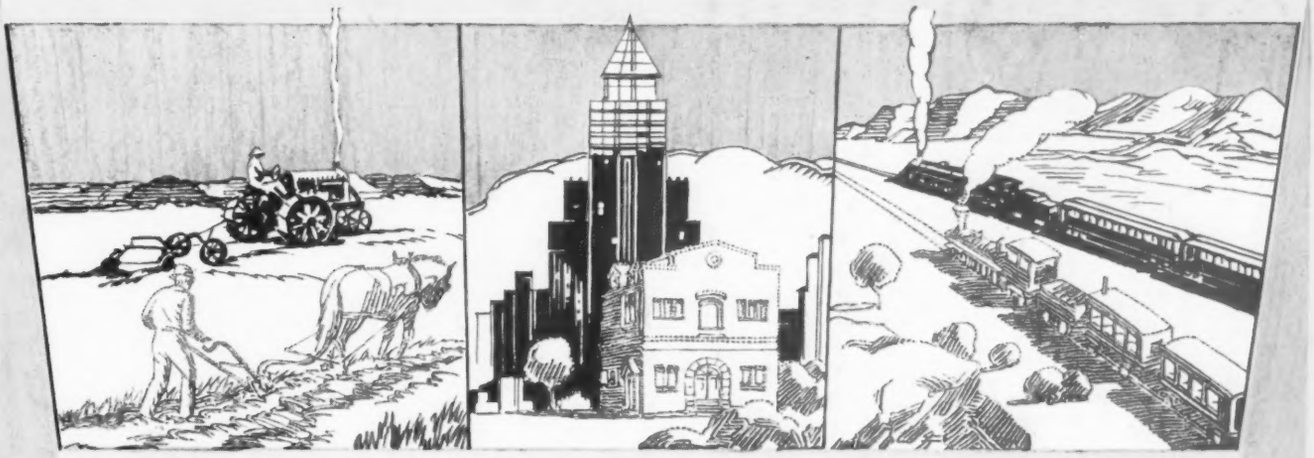
IRON TRADE REVIEW

STEEL



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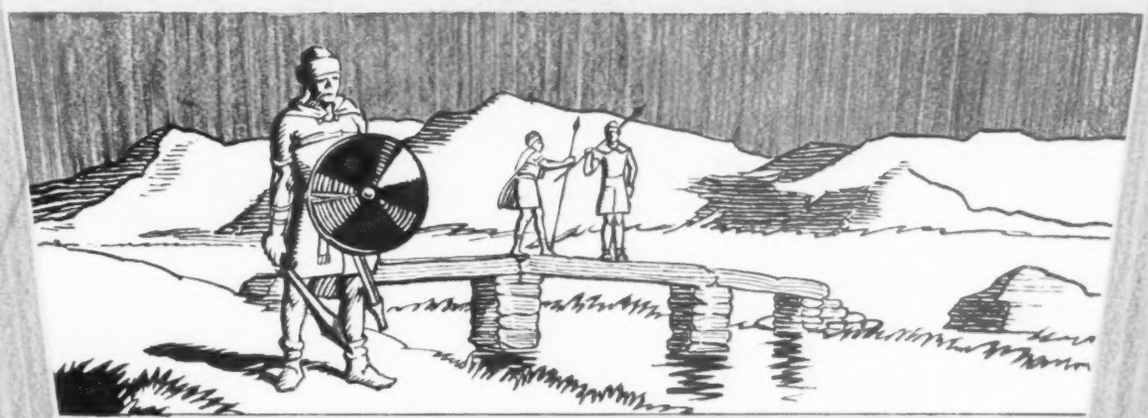

BRONZE

STONE

July 3, 1930

MORE
BECKER
OVENS
FOR
CONSOLIDATED GAS

The Koppers Construction Company is designing and building an addition to the Becker Oven Plant of the Consolidated Gas Company at Hunts Point, New York

The addition will include Thirty-Seven Producer Gas Underfired Becker Ovens with a daily coal capacity of approximately nine hundred tons. There will also be included the necessary extensions and additions to by-product and material handling plants.

KOPPERS

CONSTRUCTION COMPANY
KOPPERS BUILDING PITTSBURGH

KOPPERS
EQUIPMENT

Koppers offers the by-product Coke and Gas Industry: Becker Type Oven Plants . . . Benzol Plants . . . Gas Producers . . . Water Gas Plants . . . Liquid Purification Plants . . . By-product Equipment . . . Gas Dehydration Plants . . . Material Handling Plants . . . Phenol Removal Plants, Etc.

Vol. 87, No. 1, July 3, 1930, issue of STEEL, published weekly at Cleveland, O. Entered as second class matter at the post office, Cleveland, O., under the act of March 8, 1879. Subscription $6 a year in U.S. and Canada; foreign £2:0:0; single copies 25c.

Announcing

IRON TRADE REVIEW

STEEL

OLD ENOUGH TO KNOW THE GREAT TRADITIONS OF STEEL—
YOUNG ENOUGH TO LEAD THE INDUSTRY IN A MODERN AGE

Changing Conditions Are Recasting Industry in a New Mold

CHANGE and movement are the new order of the day. Perhaps at no time in history have revolutionary developments appeared with such frequency and surprising celerity as they are today.

• This is especially true of the steel industry. Almost every day an important discovery is announced in alloy steels, in improved or new processes, in the design or construction of equipment or in methods of management. Long established practices may be swept away overnight by the sudden appearance of a new idea. Tradition trembles before the might of this new tempo of economic change.

• These conditions are reshaping the character of the steel industry. Just as surely as steel has emerged through 65 years of history as the towering, all-pervading product of an industry that was once dominated by iron—just as certainly will present and future influences recast the industry in a new mold. We cannot foretell the destiny of steel, but existing developments point clearly to significant trends.

• For instance, the steel industry has reached the stage of growth where it is equipped to meet any reasonable demand for its product. It is a safe assumption that from now on as much or more attention will be given to consumption development as was accorded the problems of production in the past. From numerous activities, still conducted quietly and without great publicity, it is apparent that the industry is on the threshhold of an era of market research and intensive merchandising.

To Exploit Steel Is Industry's Problem

STEELMAKERS are beginning to realize that steel, the material, can be used advantageously in many articles where other materials now are employed. Likewise they know that other metals, such as copper, aluminum and perhaps nonferrous alloys not yet developed, will be pitted against steel in certain markets. These competitive situations call for a more intelligent exploitation of steel, which involves activities that will carry the industry into new lines of effort.

• The successful exploitation of steel will necessitate more and better co-ordinated scientific research, improved relations between the steel industry and the public, continued and if possible greater efficiency in production, revolutionary changes in methods of merchandising, and finally throughout the rank and file of the personnel of the industry a greater knowledge, a higher appreciation and a more enthusiastic consciousness of the qualities and merchandising possibilities of steel.

• To exploit steel effectively is the biggest task confronting the industry today. It calls for the co-operation of all interested companies and business organizations, and also for the guidance, co-ordinating influence and inspirational force of an agency equipped with authority and ability to lead the industry toward its objective. The functions of such an agency are best performed by a business paper.

CONSEQUENTLY Iron Trade Review dedicates its prestige, influence and power to the exploitation of steel. As an initial step, its publishers have discarded the name "Iron Trade Review" and beginning with the issue of July 3, 1930, the publication which has carried that title for nearly 50 years appears under the name "Steel".

• The advantages of the new name are obvious. The old name, acquired at a time when iron was a dominant influence in the industry, has been outgrown. Steel in its various aspects is the thread of common interest running through practically all the editorial contents. Steel is the common factor of reader interest. Steel defines the scope and purpose of the publication more accurately than any other word. Steel is the dynamic key word of the industry served.

Endow "Steel" with Improved Facilities for Service

CONCURRENT with the change in name, the format, arrangement of editorial and advertising pages, typography, and other physical characteristics of the publication "Steel" have been improved.

• More flexible printing schedules have made it possible for the first time to distribute the editorial pages so that the news articles and information of greatest interest to the largest number of readers are more accessible. A digest enables the busy executive, with only a few minutes at his disposal, to "high spot" the week in steel. "Mirrors of Motordom", one of the most widely and closely read features of any business paper, is given a more prominent position. Greater opportunity is afforded for effectively presenting and interpreting major news items. The Business Trend is increased in effectiveness through the use of color. The market reports are presented in more legible form. Prices are quoted in larger type.

• The diversification of activities in the technical branches of the steel industry makes it practically impossible for a weekly business paper to cover all important developments in detail. In order to improve service in this respect, "Steel" presents a comprehensive digest of all significant happenings in the technical branches of the steel industry in addition to its usual engineering articles. Thus for the first time, readers of "Steel" are given complete coverage of this essential department of the industry.

Better for Readers and Advertisers

IN recent years the character of copy in advertising has improved tremendously. Today advertising pages carry information comparing favorably with the editorial pages in point of interest and value to the reader. To stimulate the preparation of better advertisements and to encourage readers to derive the fullest values from advertising pages, advertising and editorial pages have been regrouped. The new make-up is advantageous to readers and advertisers alike.

In the main, the editorial policies which carried Iron Trade Review from obscurity to a position of high rank in business paper publishing remain unchanged. To "Steel" are given greater freedom of action and increased opportunities for editorial evaluation and interpretation. In every respect the publication is more closely attuned to swiftly moving events in the industry served.

Thus is "Steel", Logical Successor to Iron Trade Review!

WITH "STEEL" on the masthead, with steel, the material, to be exploited; and with steel, the industry, to be served, the course of the publication is charted definitely. And in striving to create an informed leadership among the rank and file of the industry; to facilitate the exchange of useful information on business, economic and technical matters; and to support all constructive movements affecting steel, the publication brings to its task new strength, clearer vision and a will to make "Steel" the true exponent of steel, the material.

IRON TRADE REVIEW

STEEL

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CLEVELAND

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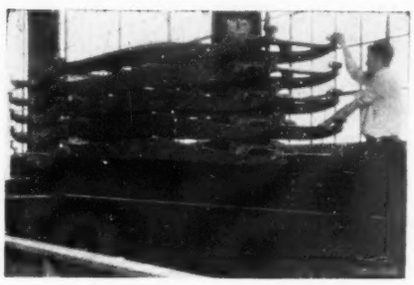

Heat Treating Imparts High Strength to Truck Frames. Page 51.

THIS WEEK:

FACTS, figures, details—this issue of STEEL *is replete with them, but for the busy reader who wants to grasp the most information in the least time there is the introductory feature, The Week in Steel. The short, crisp paragraphs contain the essence of the news.*

The question most frequently asked today is: "When will business improve?" STEEL *interviewed business and industrial leaders in many widely distributed sections of the country. Their opinions and viewpoints are summarized on page 30.*

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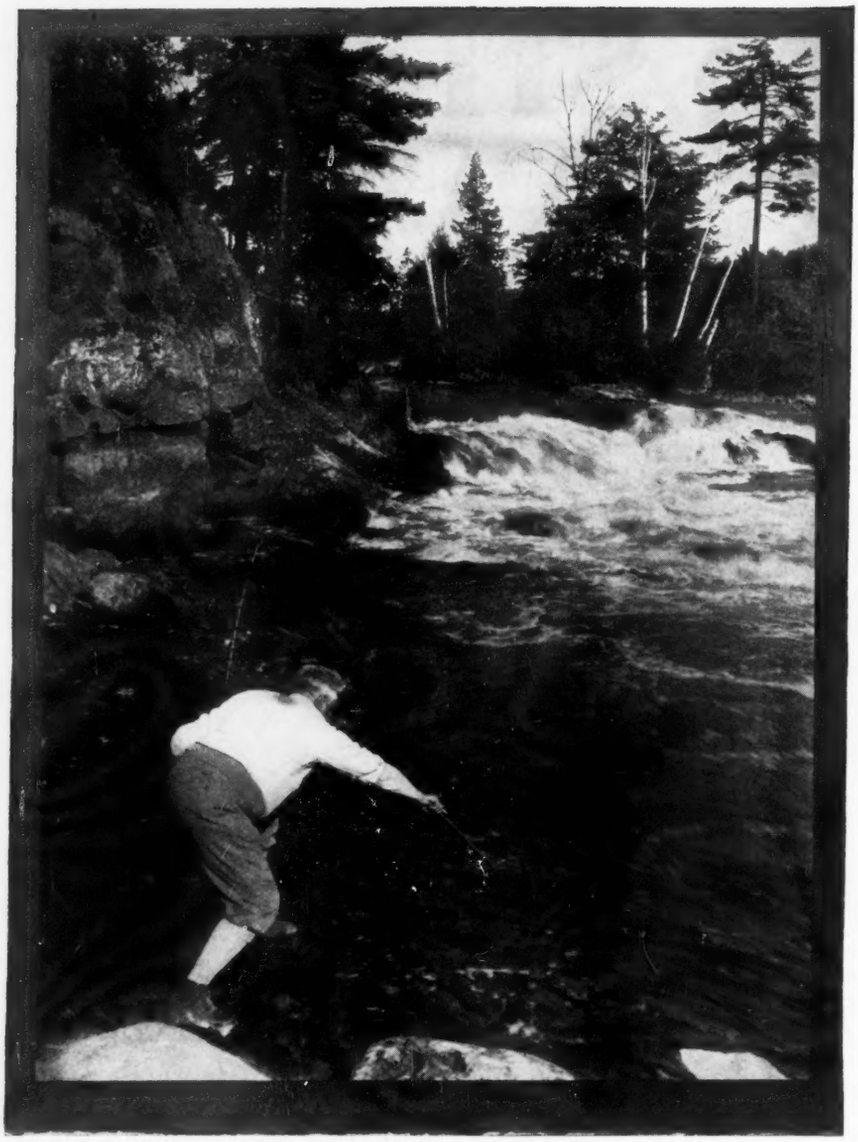

There's Nothing Like It

A cool breeze rippling through the pines — fish that fight—and the old plant at home completely forgotten.

Before you go, leave the vacation order that eliminates any worry over steel deliveries. Just say, "Call Ryerson when you need steel." Immediate shipment is assured.

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RYERSON
STEEL-SERVICE

Volume 87 Number 1

IRON TRADE REVIEW
STEEL

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

For any derelict that has tires and a battery Henry Ford is paying $20. Down two disassembly lines go these wrecks, stripped of one part and then another, until the torso is crushed under a 20-ton press and dispatched, wheels, wood and all, to the open-hearth steel furnaces. At 375 a day, Ford is wrecking more cars than a good many manufacturers are making. The plan nets scrap, makes safer the highways, and may eliminate landscape-marring auto graveyards. Page 29.

How about business in the last half of the year? It's a question industry is asking as it passes midyear. STEEL'S editorial representatives in the important steel markets learn July is expected to be a slow month, August may show a slight rebound, the rest of the year is anyone's guess—provided he is not too optimistic. Page 30.

Scrap Getting To Be a Business

Even scrap, most individualistic sector of the iron and steel industry, is worrying about costs. Believing ruinous prices are bred by ignorance, the Cincinnati chapter of the Institute of Scrap Iron and Steel is going to survey costs. Meanwhile, the scrap dealers' institute is asking the American Iron and Steel institute to recognize the dealer and condemn direct trading. Page 113.

Untrammeled by antitrust laws, European steelmakers organized their entente to fix prices and control their industry. It was a fine scheme—until demand slumped, the law of supply and demand asserted itself, and human nature devised rebates and other subterfuges to circumvent restrictions and win business. Now, to save the entente, steelmakers are setting up comptoirs for various products. No matter by whom booked, orders will clear through a central office, where prices will be fixed and tonnage evenly distributed among all makers. Page 31.

When you next feel the sting of a hypodermic needle, be nonchalant. Remember that a tubular chrome-molybdenum billet, 2 to 3 inches in diameter, was given 60 to 75 cold draws, with a thorough anneal before each draw, to get the reduction to a wall thickness of 0.001-inch. An ingenious electrically-heated salt-bath furnace makes the needles uniform. Page 62.

Try Heat-Treating 40-Foot Frames!

Modern motor buses and trucks are monsters of power and speed, in the attainment of which heat-treated alloy steels have contributed a

Most beautiful long-span steel bridge erected in the United States in 1929, is distinction accorded Mount Hope bridge by American Institute of Steel Construction. Designed by Robinson & Steinman.

major part. Mechanical and structural parts are made stronger, yet lighter and more economically than ever before. Side frames, for example, are formed from chrome-nickel, manganese or carbon steel plates and, although 30 to 40 feet long, are heat treated on a production basis. Some unusual processes for fabricating and hardening these large members have been developed in one large plant. Because of its size, production equipment is somewhat out of the ordinary. Page 51.

Apartment Dwellers Will Welcome This

If the 800,000 residences built in the United States annually were to use floors of steel plates, the market for structural steel, amounting to approximately 3,850,000 tons a year, could be more than doubled. The average home would require 7½ tons of steel; the total for all would be 6,000,000 tons. This potential market must be developed not by substituting steel for wood but by using steel along engineering principles applying to its physical properties. Page 54.

That robot at Washington which calculates tides years in advance has nothing on a formula the experts have concocted for determining the life of machine tools. Take any tool, apply the formula, and you can tell almost to the day when it will have paid for itself. Page 89.

Polish 8000 to 9000 radiator shells a day by hand? Not Henry Ford. When his engineers adopted rustless steel for Model A radiators they also had to devise an automatic polisher. Now there are nine of them at Fordson, under which fixtures holding five shells pass on a conveyor. It's one of the slickest operations to be seen at Fordson, and that is saying a great deal. Page 69.

Principles of mass production have been applied to steel tank cars. Faced with the necessity for speeding the fabrication of 1000 tanks 8 feet in diameter and 36 feet long, a steel car builder installed three sets of power-driven rolls on which the tanks could be rotated to facilitate bolting and riveting. Solid rubber tires are used on the rollers. Page 56.

Turn to South America for Ore

Iron ore experts are saying that in about twenty-five years the cream of the Lake Superior ores will have been transported to lower lake ports and smelted. Prompting some of the recent steel mergers has been the necessity of safeguarding future supplies of ore. Presumably there are no undiscovered ore bodies of any size in the United States, but South America beckons. In Venezuela the long-established Hanna interests of Cleveland are prospecting. Peru has confirmed reports of a large body of ore on its coast. Page 32.

There is no suggestion that Henry Ford needs the money but it so happens that for each of the ten working days his Fordson plant will be closed, beginning July 11, he will save $800,000 in wages. Clerical forces of many Detroit automobile manufacturers have been enjoying a five-day week, but their Saturday morning off will be less enjoyable now that they will be docked for it. There will be less purchasing power to buy automobiles. Page 40.

When iron and steel business first declines, the open-hearth furnaces and bessemer converters are first to go out, because they are flexible. When blast furnaces are dropped, it is an indication of retrenchment. In June exactly twenty blast furnaces, one-ninth the number making iron when the month opened, were taken out. Presumably the decline in pig iron production will be greater in July than in June because many of the furnaces contributed considerable tonnage to the June total. Page 35.

Behavier Under Stress also Tests Steel

Just as proof of a pudding is in the eating, so is the test of steel its behavior under stress. Year in and year out committees of the American Society for Testing Materials study the performance of steel and other important engineering materials. Unceasing vigilance enables them to note changes in the requirements of steel and to alter specifications to conform to the march of progress. Once each year the members of this society meet to review the work of its committees. The 1930 meeting was held last week, and as usual, hundreds of reports and papers were discussed. Pages 33, 65, 66 and 73.

When a long-established company moves to a new location there is an inevitable severing of ties. Many employes are loath to forego their associations of years' standing; many are left without new employment readily available. Sometimes it is the employes' hard luck to be left in such a situation. But a leading manufacturer, on moving recently, undertook to soften the divorce from faithful employes by the payment of bonuses, and in the case of the older workers, established pensions for them. Page 29.

Sheet & Tube Merger Case Postponed to July 8

HEARING of the two suits to enjoin the sale of Youngstown Sheet & Tube Co. to Bethlehem Steel Corp. will be resumed in Youngstown, O., July 8. Following the taking of numerous depositions by opponents of the sale, the case came to trial before Judge David C. Jenkins last Wednesday. It was progressing to the point where witnesses were to be called and James A. Campbell, chairman of Sheet & Tube, was ready to take the stand Friday morning when the case was suddenly interrupted by the death of Leroy A. Manchester, chief counsel for the Sheet & Tube. Adjournment and postponement of the hearing followed immediately.

The suits were brought by Myron C. Wick Jr. and the International Shares Corp. in which Cyrus S. Eaton and associates are heavy stockholders, both of the plaintiffs having substantial stock interest in the Youngstown company.

Arrayed on either side are a score of lawyers, Sheet & Tube counsel being headed by Newton D. Baker, former secretary of war, and former Judge James B. Kennedy, last chairman of the Brier Hill Steel Co., and F. N. Wood and H. N. Moore, of Bethlehem counsel. The Wick-Eaton legal staff is headed by Luther Day and Harry J. Crawford, the latter of Squire, Sanders & Dempsey, Cleveland.

Counsel Outlines Cases

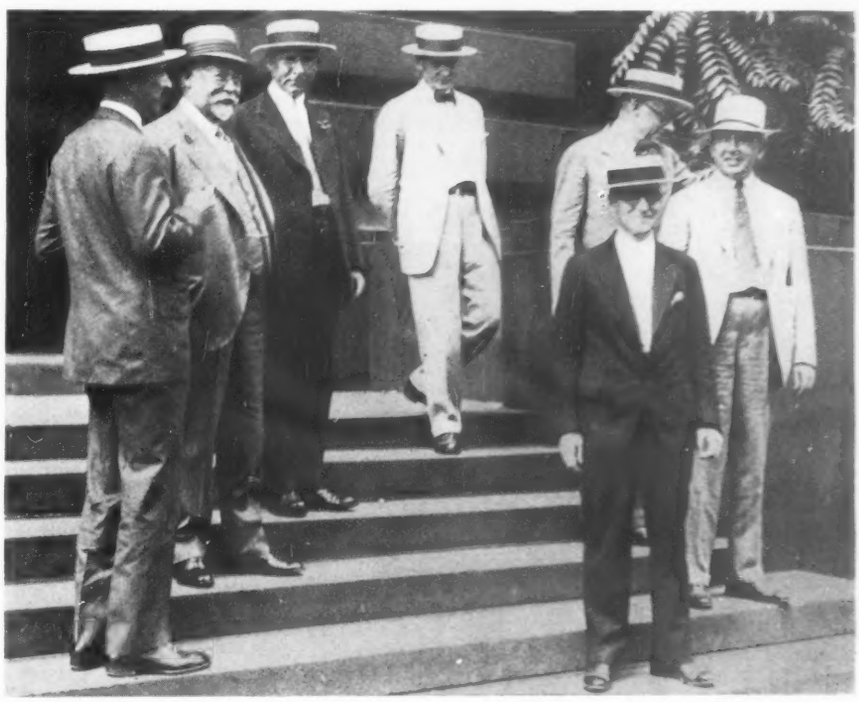
Among those at the hearing were Eugene G. Grace, president of Bethlehem; James A. Campbell, chairman, Frank Purnell, president, and H. G. Dalton, vice president, Sheet & Tube; R. B. McMath, financial vice president, Bethlehem; Elton Hoyt II, Pickands, Mather & Co.; John L. Severance, Sheet & Tube director for many years; Walter E. Meub, secretary and treasurer of Sheet & Tube, and William J. Morris, a vice president. Mr. Eaton was accompanied by Ferdinand Eberstadt, New York partner of Otis & Co.

In outlining his case, Mr. Day held that Chairman Campbell and Vice President Dalton were disqualified to vote as directors of the Sheet & Tube on acceptance of the merger contract with Bethlehem because they were interested in both companies. He implied that the Ohio law on proxies is unconstitutional. He claimed that essential data concerning Bethlehem stock values had been withheld from Sheet & Tube stockholders, and they were prevented from voting intelligently. He intimated strongly that data supplied by Price, Waterhouse & Co., certified accountants, and read to Sheet & Tube directors later were hidden and denied to the merger opponents. He charged "fraud and concealment of facts, intentional or otherwise" by directors favoring the merger.

Mr. Baker maintained there was no secrecy intentional in withholding Bethlehem data, declaring William G. Mather, Mr. Eaton's partner, had been informed of the merger steps during Mr. Eaton's absence in the South, and upon the latter's return Mr. Eaton had waived away the Bethlehem data at the Cleveland meeting in March when it was offered to him by Mr. Campbell. Mr. Baker claimed Mr. Eaton declared he "had other plans in mind for Sheet & Tube." Mr. Baker gave his "professional assurance" that the mysterious four trunks stored in the local warehouse "did not contain one paper, book or document" from which President Purnell previously had read to Sheet & Tube directors regarding Bethlehem stock values, and added that the papers which Purnell had held in his hand on that occasion could be carried in one's pocket.

Two propositions put forward by Mr. Baker were commented upon by the court as making "interesting complications." One was while March 22 was fixed in the call for the stockholders' meeting for April 8 for the proxy vote, this March date was for the purpose of listing the names of Sheet & Tube stock owners entitled to vote as of that date, yet the books of the company never had been declared closed "in order to keep the stock fluid" and thus permit the ordinary transaction of business; hence, proxies could be given on the stock up to the time of voting. The second proposition was that under Ohio statutes proxies thus given were valid up to voting time, unless revoked by previous owners.

Thursday was devoted by the Wick-Eaton complainants to laying before the court a total of 36 exhibits which were read by Mr. Crawford. These exhibits consisted of letters, printed announcements,



PRO-MERGER GROUP LEAVING COURTHOUSE AT YOUNGSTOWN

Last photograph taken of Leroy A. Manchester, chief counsel for the Youngstown Sheet & Tube Co., whose death Friday halted the Bethlehem-Sheet & Tube merger trial, finds him fourth from the left in a group of pro-mergerites, leaving the courthouse at Youngstown. From left to right are Elton Hoyt II, of Pickands, Mather & Co.; John L. Severance, director of Sheet & Tube; William J. Morris, vice president of Sheet & Tube; Mr. Manchester; John W. Ford, director of Sheet & Tube; Newton D. Baker, counsel for Sheet & Tube; and Frank W. Purnell, president of Sheet & Tube

forms of proxies and revocations, and much of the voluminous publicity put out by Sheet & Tube officers and by opponents of the sale.

Judge Jenkins previously ordered Bethlehem to allow the complainants' auditors to have access to the Bethlehem books under specified restrictions against disclosing trade secrets, but now he ruled out such testimony, saying it might come up later. The final exhibit was the petition of Arthur B. Taylor, Elyria, O., banker and owner of some hundreds of Sheet & Tube shares, filed April 3, 1930, praying for an injunction against the sale of Sheet & Tube to Bethlehem until sufficient data were available upon which stockholders could vote intelligently.

Urges Industry Clean House, Sell Scrap

Industry, with time on its hands, should clean house, affording additional employment, providing revenue from the sale of scrap and salvaged materials, and creating traffic for the railroads.

Thus P. J. Coleman, district manager of car service division, American Railway association, urged shippers at a recent meeting of the northwest shippers' advisory board, Minneapolis. He promised railroads will co-operate in finding markets for scrap.

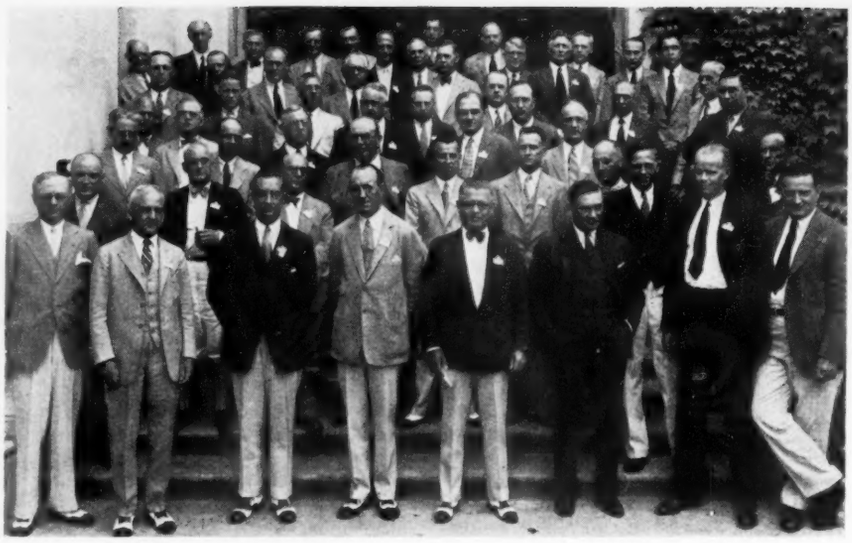
In much the same vein the industrial committee of the New England council four months ago urged members to clean up, overhaul machinery, proceed with alterations, develop plant modernization programs.

To modernize, 31 per cent of manufacturers canvassed by the council cleaned up and painted, 23 per cent overhauled machinery, 27 per cent installed new equipment. To merchandise more aggressively, 21 per cent intensified their advertising, 16 per cent developed new products, 12 per cent improved their selling organization.

Bans Steel Made by Basic-Bessemer Process

Revision of the British Engineering association's standard specification has given satisfaction to British steelmakers as for the first time it excludes basic-bessemer steel which hitherto has been included, according to Alfred Nutting, consulate general's office, London, in a report to the department of commerce, Washington.

Basic-bessemer steel has not been made in Great Britain for many years. It continues to be the principal method of manufacture employed in France and Belgium, however, and it is stated that upward of 90 per cent of the steel now being imported into England is produced by this process.



CONFIDENT OF BUSINESS IMPROVEMENT

Members of Steel Founders Society of America holding June meeting at White Sulphur Springs, W. Va., see orders increase in last quarter

Steel Founders Look for Good Fourth Quarter

STEEL castings demand seems to have reached the bottom and although no immediate improvement is expected, hope is held for decided increases in the last quarter. This was the opinion of over 100 members of the Steel Founders Society of America meeting at White Sulphur Spring, W. Va., June 26-27. Bookings were reported above 60 per cent and operations above 70 per cent; inquiries are fair but affected by the normal summer lull. Compared with the 1921 depression, business is at a considerably higher level.

With the addition of 22 new members, the total membership of the society is now 70, according to Granville P. Rogers, managing director. Additional progress was indicated in the fostering of reports on operations, bookings, shipments, raw material market trends and information service. In his report, Mr. Rogers cited instances of changing trends which have overturned apparently stable markets for commodities. To avoid industrial depressions, manufacturers must know the consumer market in terms of the whole industry as well as in relation to their own plants. Value of the trade association in stabilizing markets and improving business conditions was emphasized.

It was announced that the society's standard trade customs will be sent to all steel foundries. These customs, published on Page 51 of the June 26 issue of IRON TRADE REVIEW, predecessor of STEEL, cover foundry and customer relationships and deal with such matters as quotations; ownership, responsibility and charges relating to patterns; sales contracts and order acceptances.

President John E. McCauley, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., in convening the meeting, made brief remarks upon the need for co-operation and constructive thinking. Principal speakers at the various sessions were Dr. Hugh P. Baker, manager, trade association department, Chamber of Commerce of the United States, Washington, who discussed salient points affecting the value of trade association work; Roger L. Wensley, G. M. Basford Co., New York; speaking on the relation of advertising to merchandising; J. Noble Braden, American Arbitration association, New York, explaining arbitration of trade disputes; Charles F. Abbott, American Institute of Steel Construction, New York, advocating a plan for trade stabilization; E. St. Elmo Lewis, Detroit, speaking on demands of the buyer's market; W. H. Worrilow, Lebanon Steel Foundry, Lebanon, Pa., on castings selling; and F. A. Melmoth, Detroit Steel Casting Co., Detroit, on complexities of steel castings.

Philadelphia Steel Club Golfs

Philadelphia—Steel Club of Philadelphia held its annual golf tournament at Arnonomink Golf club near Philadelphia, June 27. It was fol-

lowed by the usual dinner, presided over by Paul King, of Worth Steel Co., president of the club. The affair was attended largely by buyers in this general territory.

Norton Co. Remembers Employes Left Behind

Buffalo—The Norton Co., now moving its abrasive plant from Niagara Falls, N. Y., to Niagara Falls, Ont., will reimburse employes of long service who will be dropped from its payrolls as the result of the move. Each employe of three years service will receive $100, those of five to ten years, $150, with $15 additional for each year of service, and a pension to all of more than 20 years service. About 37 per cent will receive dismissal disbursements.

Begin New York Radio City

New York—Wrecking operations have started on Forty-ninth street, off Fifth avenue, as first step toward construction of "radio city" by the Rockefeller interests, cost of which by preliminary estimates exceed $200,000,000. Theaters, radio studios and other buildings to cover about three square blocks in the midtown section are included in the plan. While it is understood that many of the buildings will be six and eight stories high, the group will probably be topped by two and possibly four large towers.

Todd, Robertson & Todd, Graybar building, are the engineers for the project and Reinhard & Hofmeister are the supervising architects. Todd & Brown, it is understood, will be the general contractors. The project is to be completed in 1933. Additional land was bought by the Rockefeller interests this week in the midtown area.

Ford Disassembling 375 Auto Derelicts a Day

THREE disassembly lines, manned by 120 workmen, in the open-hearth building of the Ford Motor Co., at Fordson, Mich., are converting 375 antiquated automobiles in two 8-hour shifts into scrap for the ten Ford open-hearth steel furnaces and material for the Ford, glass, rubber, fabric and kindred reclamation plants which transform the scrap into useful materials.

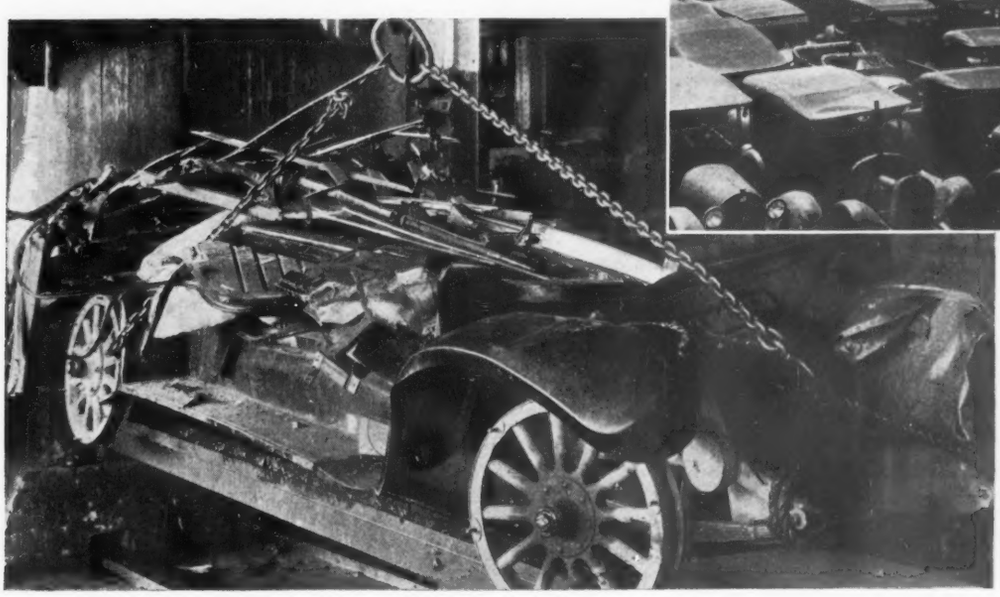
Eighteen thousand derelicts having been scrapped at Fordson since Feb. 5, the disassembly plan is termed a success. The work will be prosecuted on a more extensive scale. The derelicts, bought from Ford dealers at $20 per car, may be of any make, age or condition, provided they have a battery and some semblance of tires. One of the disassembly lines tears down Fords, the second other makes, and the third transports scrap to the furnaces and salvaged material to waiting trucks.

Following the process chronologically. First, gasoline and oil is drained; grease also is saved. On to a conveyor goes the car. Headlight lenses and bulbs are removed. Spark plugs and battery are taken out. Glass is removed—some cut out to useful sizes and broken bits taken to the glass factory for melting. Floorboards go to the box factory for conversion into crate tops.

Cotton and hair from roof and upholstery are separated, baled and sold. Muslin from tops and upholstery covers are transformed into buffing and polishing wheels. Imitation leather from tops is sewed into aprons for factory use, small pieces reappearing as hand pads. Gasoline tanks are removed, pressed and baled for recovery of terne plate.

Overhead compressed air wrenches, set in reverse, unscrew wheel nuts. Good tires are sold at the commissary; badly worn ones are put into automatic shears which sever both tire and rim, the tire being stripped of rubber and the rim going to the scrap pile. Horns, removed, are usable again or go to the scrap heap for remelting. Hubcaps go to the aluminum scrap heap, ignition wire is saved for its copper, oil cups for their brass, bushings for their brass, and bearings for their babbitt.

The derelicts, now near the end of the moving disassembly line, pass oxygen torches which burn motors loose from frames. Overhead compressed air hoists swing motors to washers, a bath of boiling water and soda ash freeing grease and dirt. The remaining torso passes to a 20-ton press which crushes it flat, ready for an open-hearth charging box. Motors, meanwhile, are stripped of their nonferrous metals, steel and cast iron, these materials eventually being remelted.



Above—Waiting to go on the disassembly line. These wrecks cost Henry Ford $20 each

To the left—A derelict auto, stripped and crushed and ready for the open-hearth furnaces at Fordson

Mild Rise, Then Uncertainty Forecast for Last Half

WHAT will business be like in the last half year, is the question industry is asking as it passes midyear. STEEL'S editorial representatives have, therefore, sought the answer.

Majority opinion is that the downturn in iron and steel which set in last summer is at or close to bottom. In the early fall, perhaps next month, a slight rebound is generally expected. Beyond that the vision is not clear, but a quiet year-end seems to loom up.

Crystallized opinion of important districts follows.

East Looks for a Better Fall but Fears Winter

New York—Most eastern steel interests look for improved business in the fall, following an unsatisfactory summer. One leading interest looks for steel operations to reach 85 per cent. Some steel companies look for a reasonably active market for at least a few months, beginning early in September.

Others concur in a varying degree, with generally less optimism expressed regarding the winter. Quite a few well-informed steel executives look for a slump by December, although not as pronounced as at present.

Important in whatever improvement takes place this fall will be railroad buying, particularly of rails. An upswing in purchase of rolling stock also is expected.

Action of the stock market in its general bearing on business is difficult to interpret. Until recent months, the trend of the market has been regarded as discounting future business. But so many precedents have been shattered since the crash in Wall Street last fall that accurate translation of the current weakness is impossible. Many believe the present slump in Wall Street is a reflection of unsatisfactory business already gone before, but they also admit prospects in steel and other basic industries are not particularly encouraging, considering the last half as a whole.

As for steel earning statements, the outlook is for a reduction. Second quarter statements will undoubtedly show a decline from first quarter, and those for third quarter, with summer dullness accepted, will likely show a further decline. A gain is expected in fourth quarter earnings. However, this gain, it is believed, will not be sufficient to carry the total for the last half as a whole above earnings for the first half.

Pittsburgh Looks for Rebound from Bottom

Pittsburgh — Opinions concerning business here the remainder of the year are tinged with uncertainty for all but a few leading steel products. Seasonal quietness, with a mild fourth quarter upturn, seems to best represent current thought.

That there will be improvement in steel demand the next 60 to 90 days is taken for granted, since it is believed business will not have touched bottom until some time this month and that later the seasonal trend in steel consumption will have a certain stimulating effect.

It is pointed out, however, that if steelmaking operations were to average no better than 60 to 65 per cent from July to January production from a tonnage standpoint would at least equal the comparable 1927 period, at the time regarded as only moderately depressed.

Recent restriction in buying and low level of inventories are factors favorable to better business, but only a few steel executives will predict a substantial September revival, the majority preferring to await signs of such a trend.

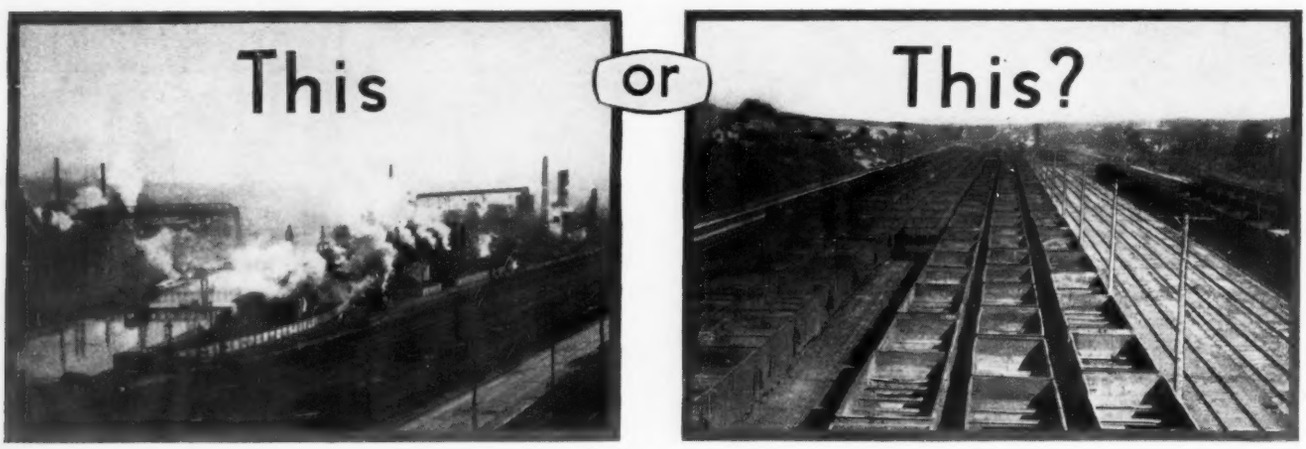
In only a few products—pipe, tin plate, structurals—is the future plotted with any clarity. As the result of record activity in placing of natural gas and gasoline lines, pipe mills are assured full operations on material 8-inch in diameter and larger practically through the remainder of the year, particularly since allowances must be made for receipt of additional business. In smaller sizes of pipe, business has been slow but producers expect a better last-half in buttweld pipe.

Tin plate shipments have been about 10 per cent below 1929, and with general outlook for sizable vegetable packs favorable, this margin is expected to be maintained during third and fourth quarters, resulting in a fairly satisfactory year.

Sheets, strip and bars, on the other hand, have a doubtful market ahead because of dependence upon automobile industry. The heavy construction outlook remains moderately favorable.

Chicago Doubtful, with Farm Situation the Key

Chicago—Much doubt beclouds the outlook in steel producing and fabricating groups have for the last half year. Steelworks units already are reconciled to an extremely dull July



and August and have adjusted affairs accordingly. Views of autumn improvement are based less upon actual signs than the theory that the tide is not forever in the ebb.

On the whole, prospects at this time for the early autumn months are decidedly mixed. Much depends upon the farm situation. With wheat and livestock prices the lowest since 1914, the farm outlook is not as encouraging as in the spring. Nevertheless. the wheat yield about equals a year ago, and western railroads are in the midst of a heavy grain movement, profitable to them.

Most large farm equipment makers are expecting a decided pickup in autumn tillage tool buying, and feel they may embark late this year upon next season's production with encouraging schedules. Implement makers may purchase 150,000 to 175,000 tons of finished steel yet this year.

Outlook for western railroad buying of steel is more uncertain. Rail mills here rolled about 1,225,000 tons of trackage for 1930 needs; much is not being laid. Should freight revenues show more vigor, it would not be surprising if an important secondary rail and track fastenings buying movement developed later. Prospects are not encouraging for important business to be placed this year with western freight car shops.

Washington Still Confident

Washington—President Hoover believes business will revive in the early autumn. He has made no recent formal forecast, but he still believes "any lack of confidence in the economic future or basic strength of business in the United States is foolish. * * We are not yet entirely through the difficulties of the situation; we have need to maintain every agency and force that we have placed in motion until we are far along on the road to stable prosperity."

Secretary of Commerce Lamont does not look for any sudden or spectacular increase in business but he is convinced the basic movement is in the right direction. Secretary Lamont uses as his yardstick an imaginary line of normal business growth, which gradually heightens in response to increasing population, increasing purchasing power, improved standards of living and similar factors. At about this time in 1921, business in general was 22 points below this imaginary line; today business is 6 points below this line.

American Plan association of Cleveland has changed its name to Associated Industries of Cleveland, because it is handling a large number of industrial problems and performing numerous services not directly related to establishing and defending the open shop, the purpose for which it was organized.

Steel Entente, Harassed, Turns to Comptoirs

AN INTERNATIONAL sales comptoir, almost a world control, for sale of semifinished steel by members of the European steel entente, will be in effect shortly if plans now pending are carried through.

Successful operation of this scheme will be followed by establishment of other comptoirs to handle other lines.

On the success of this further extension of control depends in large measure the continued existence of the entente, which has found difficult going in the past few months. General depression of world markets has brought problems difficult to solve and the comptoir idea has been worked out in principle as a solution, extending the more or less artificial control over European steel production and prices. As an experiment in modifying the law of supply and demand and avoiding the natural effects of market conditions and competition, this effort interests the entire business world.

At present the entente continues practically in its original form. Its primary object is to fix the quota of production of raw steel that should not be exceeded with penalty by its members. Since Nov. 1, 1929, the quota has been based on an annual tonnage of 29,000,000 metric tons for all the member-countries of the entente, each one producing a share of this tonnage in accordance with the percentage allocated.

Find Some Rebate Freight

Deriving from the entente are a number of committees that fix minimum export prices for certain products, semifinished steel beams, merchant bars, wire rods, plates and, of course rails. Apart from rails, sales of which are controlled by the International Rail Makers' association, the other products can be sold direct from works provided official minimum prices are applied. It has been found these measures are not sufficient to prevent export markets from being depressed. It also has been found that, by various means, some producers offer concessions. These concessions are against the spirit of the agreements set up by the entente, and weaken the market. It is known, for instance, that as official prices are on an f.o.b. basis, some producers quote c.i.f. prices in which they make concessions on freight. Another method is to accept a combined order for syndicated and unsyndicated products, such as merchant bars and sheets; the official price is quoted for bars, but sheets are cut.

The present system also has the peculiar effect that, while prices of syndicated products are artificially maintained, other products are unduly low in proportion, which cannot be prevented unless all prices are controlled.

In order to prevent infringement of price-fixing rules and to divide orders uniformly, it has been thought that export sales of syndicated products should be completely handled by international selling comptoirs.

Gradually solutions have been proposed and agreements in principle have been reached. Already an arrangement has been agreed to by the principal continental merchant firms. These are classified according to their turnover and the guarantees they can offer. All agree to quote prices fixed by entente representatives, to submit books for investigation, and to purchase only from members of the entente.

British Merchants Join

A new difficulty arose, however, with respect to British merchant firms selling continental steel in Great Britain. British steel producers are not a party to the steel entente, and the merchants refused at first to give up their independence and to comply with regulations set up by continental steelmakers. After protracted negotiations about 15 British merchant firms have agreed to quote prices fixed by the continental entente for structural steel, bars, hoops and bands and plates and have accepted a commission of 2s (48c) per ton. Certain concessions also have been made to British merchants on other points.

With regard to export sales of semifinished products, a scheme has been provisionally agreed to, according to which these sales would be handled by an international comptoir, which would fix prices, centralize orders and place them with the member-firms, so that all of them would be treated on an equitable basis.

Semifinished steel has been chosen as the first commodity to be handled in this way because it is the easiest to control and there are not many grades and sizes. If the international comptoir for semifinished steel works successfully, structural steel would follow. In the meantime, the entente will continue until 1931, with the understanding that the first international selling comptoir that for semifinished steel will be operating by Aug. 1 this year. Should this not be the case, other solutions will be sought.

Hanna Co. To Explore for Iron Ore in Venezuela

PROGRESSIVE Lake Superior iron ore producers with associated steelworks to protect do not purpose to be caught napping when the best of the "lake" ores have been consumed. In line with this policy the M. A. Hanna Co., Cleveland, is preparing for an exploration in Venezuela. It has obtained options on a large tract situated about 25 miles miles from the Orinoco river, where the deposit is estimated to contain more than 50,000,000 tons. Some unofficial estimates place the amount as high as 75,000,000 tons. The whole of Venezuela has reserves approximating 400,000,000 tons.

Bethlehem Steel Corp. at one time had an option on the land, but its holdings of more than 100,000,000 tons of good ore in Chile, and 1,300,000,000 tons of 35 to 40 per cent ore in Cuba were considered so extensive that it did not push its venture in Venezuela. Now comes the Hanna company with an investigation to determine the volume, quality and accessibility of the ore. To begin with it is known that a railroad approximately 40 miles long will have to be built to ship the ore to the nearest point for loading to vessel. The ore will have to be transported in vesels 2000 miles or more to Atlantic coast points, but this presents no difficulty as Bethlehem is shipping ore 5000 miles from Chile to Sparrows Point, Md.

The Hanna company's mining operations heretofore have been limited almost entirely to the Lake Superior district. It is one of the first of the large independent producers in that district to search for ore in foreign countries. Coincident with the merger of certain Hanna subsidiaries with Great Lakes Steel Corp. and Wierton Steel Co., in 1929, forming the National Steel Corp., the Hanna company extended its activities in the Lake Superior district and has a well-defined long-range policy of expansion there. National Steel plans a big development near Chicago.

It is not known whether the new Venezuela enterprise has anything to do directly with the merger, but it would be uneconomical to haul ore from even the most northern point of South America to the United States and then bring it by rail inland to the present furnaces represented in the National corporation.

As the Hanna company continues as a merchandiser it is assumed the ore from Venezuela would be sold along the Atlantic seaboard or to nearby furnaces. Definite plans have not been outlined and will not be until the results of the investigation are disclosed by the Hanna company commission.

The bulk of the ore in Venezuela is located in the delta of the Orinoco river, and is mainly magnetite averaging 65 per cent iron.

C. K. Leith in his mongraph presented at the World Engineering congress in Tokio last October predicted there will be a deficiency of "lake" ore in 20 years, to be made up from

The equator cuts across the Venezuelan iron ore fields. Mining presents a problem worthy of American engineering skill

southeastern and foreign sources. Commenting on Venezuela he said:

"The country has considerable deposits . . . but not enough is known of their size or of the conditions of mining and transportation in the region to warrant definite prediction. The ore is rich and there is a considerable aggregate tonnage in a large area, but recent drilling has failed to disclose any outstanding concentration in areas small enough for unit operation. Much of it must be mined by underground methods."

Mining of iron ore on the equator presents interesting possibilities. South America contains about 8,500,000,000 tons of ore, and our annual imports from there amount to 1,700,000 tons.

Peru Finds High-Grade Ore

Long-known but little-explored iron ore deposits on a sandy, rainless plateau bordering the Pacific ocean 200 miles south of Lima have been found by the Peruvian government to contain 180,000,000 tons, equal to three times the current annual consumption of American blast furnaces.

The ore, comparatively free from obnoxious sulphur and phosphorus, averages 65 per cent natural iron, compared with 51½ per cent now chiefly used in the United States. The overburden is generally shallow, permitting open-pit mining methods.

From the plateau, 3000 feet above sea level, the ore can be carried by gravity to one of two harbors, which the Peruvian government, determined to exploit the find itself, is having an American contracting firm investigate.

Ease Export Royalties

Government of Newfoundland is exempting the Dominion Iron & Steel Co. and Nova Scotia Steel Co., both of Syndey, N. S., from export royalties for 20 years on shipments of iron ore exceeding 1,500,000 tons annually.

On the first 1,000,000 tons exported the royalty will be 10 cents a ton; on the next 500,000 tons 3 cents a ton. Companies will pay $4000 annually toward upkeep of roads on Belle island, be subjected to municipal taxes up to $10,000 annually, but be exempt from customs duties on imports of coal, explosives, all equipment except hand tools.

Europe Subsides Over New American Tariff

Many and alarming were the threats hurled by Europe in the final days of tariff debate in congress, but since President Hoover made the Hawley-Smoot bill effective June 18 no reprisals have eventuated.

In the past week, hostile foreign comment has almost entirely subsided. Europe, apparently unable to force delay or abandonment of the higher duties, is accepting them, pinning some hopes of relief—from the importer's standpoint—on the flexible provisions. Only Switzerland threatens a boycott.

Domestically, the new tariff has found a defender in Secretary of Commerce Lamont. He points out that just as many protests were received when the tariff act of 1922, now superseded took effect. But in seven years, he points out, imports increased 45 per cent, and exports 100 per cent.

Dr. Julius Klein, assistant secretary of commerce and confident of Mr. Hoover when the latter was secretary, has hailed the flexible provisions of the Hawley-Smoot measure as a means of eliminating log-rolling and insuring scientific rates.

As soon as the present economic depression has run its course the Argentine may be expected to place large orders in the United States, declares the Central Hanover Bank & Trust Co., New York. The Argentine, a large consumer of American iron and steel in the form of machinery and other finished products, is rapidly becoming a convert to machine farming.

May Steel Statistics Show Activity Declines

With new orders for fabricated steel plate in May at 36.1 per cent of capacity, monthly tonnage dropped to the second lowest mark of 1930. Five-month totals, based on reports to the department of commerce, show 1930 orders 24 per cent under 1929:

1929	Total	Oil storage tanks	Blast furnaces	Stacks & miscellaneous
May	47,715	10,087	1,245	26,118
Total (5 mos.)	238,895	69,170	4,758	94,596
June	45,918	6,890	1,003	26,200
July	48,968	14,963	2,650	20,988
Aug.	39,702	11,150	115	19,341
Sept.	41,653	15,189	200	16,123
Oct.	32,099	8,786	853	15,766
Nov.	42,295	9,033	1,019	14,601
Dec.	23,535	3,669	1,529	13,166
Total (year)	513,065	138,850	12,127	220,781
1930				
Jan.	50,076	7,432	1,042	15,168
Feb.	28,332	7,865	279	11,656
March	38,051	6,593	2,749	17,675
April*	37,709	7,509	273	16,921
May	28,678	9,222	426	11,600
Total (5 mos.)	182,846	38,621	4,769	73,020

*Revised.

River Tonnage Sets Record

River shipments of iron and steel products in the Pittsburgh district in May were a record for that month. Ohio river tonnage of 128,502 almost doubled the 66,482 tons of April. Shipments on the Monongahela increased over 65 per cent, as comparisons show:

	Allegheny	Monongahela	Ohio
1929			
May	525	88,340	102,162
Total (5 mos.) ..	860	444,794	420,348
June	722	116,157	116,679
July	25	109,051	102,963
August ..	100	134,426	137,734
Sept.	.....	135,773	150,163
Oct.	.....	119,380	119,129
Nov.	500	83,189	88,011
Dec.	400	60,957	77,885
Total	2,507	1,203,827	1,212,912
1930			
Jan.	100	58,784	64,736
Feb.	210	80,327	74,385
March ..	100	111,702	109,911
April	100	70,229	66,482
May	.....	117,942	128,502
Total (5 mos.) ..	510	438,984	444,016

Coke Output Off in May

Beehive coke output declined sufficiently in May to offset a slight gain in by-product coke, giving May a total of 4,506,628 net tons, below both April, 1930, and May, 1929. Total coke production, compared in the following table, for five months of 1930 is 6 per cent less than in 1929, according to the bureau of mines, department of commerce:

1929	By Product Coke	Beehive Coke	Total Coke
May	4,664,242	597,400	5,261,642
Total (5 mos.)	22,184,165	2,517,900	24,072,065
1930			
April	4,246,436	301,700	4,548,136
May	4,265,528	241,100	4,506,628
Total (5 mos.)	21,105,551	1,434,700	22,540,251

Boiler Orders Again Gain

May orders for steel boilers, at 1280, compared with 1017 in April and 1751 in May, 1929, 81 manufacturers reported to the department of commerce. Square footage in May orders totaled 1,326,490, against 1,070,093 in April. For 1930 to date, boiler orders total 5089 with a square footage of 5,680,947, compared with 7040 units and 7,921,063 units a year ago.

Barrels in Further Slump

Steel barrel production was 731,087 units in May, the third consecutive monthly decline. Shipments also were down, although immediate unfilled orders rose, 32 manufacturers report to the department of commerce:

1929	Production	Shipments	Unfilled orders within 30 days
May	836,532	834,699	316,882
Total (5 mos.)	3,476,171	3,465,700	.....
June	774,853	779,567	644,079
July	790,175	782,411	377,355
Aug.	806,574	809,860	358,150
Sept.	663,531	653,890	302,632
Oct.	629,976	638,681	298,550
Nov.	572,621	567,257	285,295
Dec.	624,365	618,003	294,797
Total, (year)	8,338,266	8,315,369	.....
1930			
Jan.	650,764	643,120	304,354
Feb.	648,709	643,324	313,349
March*	842,186	856,451	452,933
April	769,061	766,617	322,161
May	731,087	736,147	394,843
Total (5 mos.)	3,641,807	3,645,659	.....

*Revised.

Weekly Coal Rate Mixed

Washington—Bituminous coal production was 7,994,000 tons for week

(*Continued on Page 37*)

Aviation Wins Recognition at Testing Materials Session

Aviation came in for its first official recognition from the American Society for Testing Materials when the society, at its annual meeting at Atlantic City, N. J., June 23-27, devoted an entire day to a symposium on aircraft materials.

Committees investigating the properties of steel, wrought iron and cast iron reported considerable progress in the past year. Reports included an investigation of phosphorus in wrought iron, long time tension tests of steels at elevated temperatures, and yield point of structural steel.

H. F. Moore, University of Illinois, Urbana, Ill., chairman of the research committee on fatigue and corrosion of metals announced that within a short time a comprehensive review of the present knowledge of the fatigue of metals will be published by the society. Committee A-5 on corrosion of iron and steel, J. H. Gibboney, Norfolk & Western railroad, Roanoke, Va., reported further results on the atmospheric and immersed corrosion tests on sheets at Annapolis, Md., Key West, Fla., Portsmouth, N. H., and Port Arthur, Texas.

President T. D. Lynch in his annual address said that to increase the usefulness of raw materials it was necessary to have adequate knowledge of their properties. Management must not fail to give due support to research work as it leads to progress, and due to the rapid advances in engineering sciences the members of the society should always be prepared for the future.

Officers elected for the ensuing year were announced as follows: President, K. G. Mackenzie, Texaco Co., New York; vice president, Cloyd M. Chapman, New York; new directors, F. H. Jackson, United States bureau of public roads, Washington; Zay Jeffries, Aluminum Co. of America, Cleveland; G. A. Reinhardt, Youngstown Sheet & Tube Co., Youngstown, O.; H. N. Van Deusen, Bell Telephone Laboratories Inc., New York, and H. H. Quimby, Philadelphia.

The annual meeting of the society in 1931 will be held at Chicago.

May Exports Slump Sharply As Imports Hold

IRON and steel exports in May, at 196,120 tons, slumped for the second consecutive month. Imports remained virtually stationary at 52,814 tons. Five months exports for 1930, at 1,065,609 tons, lag 21 per cent behind 1929. Imports by the same comparison have decreased 17 per cent.

Despite reduction in exports for the past two months, a trend was hardly to be noted, volume of shipments being about equally divided between increases and declines, according to the iron and steel division, department of commerce, Washington.

Shipments rose to North and Central American countries and the West Indies, every other territory declining. Canada, our leading foreign market, took a total of 87,060 tons or 11,395 tons more than in April, the gain principally in scrap tonnage imported. Japan, second market of importance, declined in her commitments from April's 35,619 tons to 27,801 tons in May.

On the basis of tonnage the principal product in May's trade was scrap, 40,051 tons being exported. Tin plate with 17,012 tons was second and 15,695 tons of skelp was third in importance. However, by way of com-

IMPORTS AND EXPORTS

Gross Tons

	—1930— Imports	Exports	—1929— Imports	Exports
Jan.	42,314	225,090	54,793	274,296
Feb.	43,351	197,426	58,146	259,711
Mar.	55,604	238,333	52,747	270,925
April	52,650	208,640	54,337	277,580
May	52,814	196,120	74,272	261,516
Total(5 mo.)	246,733	1,065,609	294,295	1,344,028
Jun.	.....	.....	63,635	247,811
July	.....	.....	71,378	270,532
Aug.	.....	.....	83,969	242,856
Sept.	.....	.....	60,974	222,408
Oct.	.....	.....	63,226	247,646
Nov.	.....	.....	54,041	241,829
Dec.	.....	.....	47,486	215,242
Total	.....	.....	739,004	3,032,352

ORIGIN OF MAY IMPORTS

Gross Tons

	Ingots	Steel scrap	Cast iron pipe	Steel bars
Austria	.....	.....	.....	20
Belgium	738	.....	.....	1,527
Canada	45	1,620	.....	1
Cuba	.....	35	.....	.....
Czechoslovakia	.....	.....	.....	15
Denmark	.....	.....	.....	.....
France	146	49	340	696
Germany	78	.....	.....	248
Italy	.....	35	.....	.....
Jamaica	.....	10	.....	.....
Norway	6	.....	.....	6
Mexico	.....	.....	.....	.....
Sweden	79	.....	.....	.....
Switzerland	.....	.....	.....	556
United Kingdom	25	.....	2	32
Total	1,117	1,749	342	3,101

IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

	May 1930	April 1930	May 1929
Pig iron	13,891	12,183	14,393
Ferroman'ese and alloys (1)	4,031	5,153	4,756
Ferrosilicon (2)	742	846	733
Ferrochrome (3)	.....	.....	121
Scrap	1,749	1,770	6,837
Steel ingots, blooms, billets etc.	1,117	1,347	2,863
Steel bars	3,101	4,163	3,912
Iron bars	62	213	222
Wire rods	490	1,019	2,778
Hoops, bands and scrolls	2,098	2,394	5,039
Sheets, skelp and sawplate	1,558	3,962	3,199
Structural shapes	19,640	15,122	14,744
Rails and splice bars	467	428	744
Cast iron pipe	342	645	6,907
Other pipe and tubes	1,587	1,426	4,170
Round iron and steel wire	829	487	467
Wire rope and strand	348	311	206
Nails, tacks and staples	229	322	1,099
Bolts, nuts, rivets, and washers	59	58	11
Castings and forgings	164	222	190
Miscellaneous	636	1,009	1,172
Total	52,297	52,650	74,272

(1) Manganese content.
(2) Silicon content.
(3) Chromium content.

ORIGIN OF MAY IRON AND STEEL IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese	Ferromanganese
Algeria and Tunis	51,230	.....	.....	.....
Australia	28,315	.....	.....	.....
Belgium	.....	.....	.....	.....
Brazil	.....	.....	8,315	.....
British India	.....	7,809	4,420	.....
Canada	3	32	15	2,262
Chile	138,833	.....	.....	.....
Cuba	39,054	.....	.....	.....
France	.....	.....	.....	22
Germany	.....	.....	.....	.....
Gold Coast	.....	.....	6,493	.....
Italy	.....	.....	.....	100
Java	.....	.....	280	.....
Netherlands	.....	3,028	.....	.....
Newfoundland	10,240	.....	.....	.....
Norway	.....	783	.....	857
Panama	.....	.....	.....	.....
Soviet Russia in Europe	.....	.....	10,200	.....
Spain	7,900	.....	.....	.....
Sweden	15,797	130	.....	.....
Turkey in Europe	.....	.....	.....	.....
United Kingdom	.....	2,109	.....	790
Total	291,372	13,891	29,723	4,031

EXPORTS OF IRON AND STEEL PRODUCTS

In Gross Tons

	May 1930	April 1930	May 1929
Pig iron, not incl. ferroalloys	1,072	1,327	8,088
Ferromanganese and spiegel	1,004	1,387	88
Scrap	40,051	47,907	56,055
Ingots, blooms, etc.	1,788	2,316	6,704
Iron bars	188	77	341
Steel bars	7,893	11,424	14,765
Alloy steel bars	941	740	974
Wire rods	4,535	4,299	3,197
Plates	8,668	12,150	20,185
Skelp	15,695	5,399	15,244
Iron sheets, galv. (1)	865	372	11,022
Steel sheets, galv. (1)	8,013	7,477	11,022
St'l sh'ts, black	9,896	12,105	14,060
Iron sh'ts, black	875	858	1,526
Hoops, bands, and strip	4,611	3,824	6,233
Tin plate, terne, etc.	17,012	23,137	14,537
Struct'l shapes, not fab.	10,123	12,665	30,331
Struct'l shapes, fab.	9,332	6,897	6,652
Tanks, complete and K. N. (2)	973	1,328	.....
Metal lath	411	664	490
Steel rails	11,926	13,704	10,499
Rail fastenings, switches, frogs, etc.	1,916	1,953	2,318
Boiler tubes	1,228	2,362	1,613
Casing and oil line pipe	7,880	6,944	8,083
Malleable - iron screwed fittings	1,115	889	701
Cast iron screwed fittings	605	456	1,154
Cast iron pressure and fitt'gs	1,342	1,194	649
Cast iron soil pipe and fitt'gs	849	386	926
Black and galv. welded wrought iron pipe (1)	1,573	1,090	8,327
Black and galv. welded steel pipe (1)	8,175	7,085	8,327
Plain wire	2,664	3,339	3,518
Barbed wire and woven fencing	4,462	4,763	5,409
Woven wire screen	152	102	142
Wire rope	527	468	505
Insulated wire, cable, iron and steel	34	44	115
Other wire, manufactures	634	650	821
Wire nails	623	666	513
Nails, other than wire	632	510	482
Tacks	40	60	55
Bolts, nuts, rivets, except railway	990	908	1,234
Iron castings	768	644	1,174
Steel casting	738	2,123	1,011
Car wheels and axles	2,494	1,183	1,584
Horseshoes	12	3	8
Forgings	795	761	996
Total	196,120	208,640	262,329

(1) Combined prior to 1930.
(2) Included in a miscellaneous classification prior to 1930.

DESTINATION OF MAY IRON AND STEEL EXPORTS
Gross Tons

	Galvanized steel sheets	Tin terne plates	Black sheets	Steel bars
Argentina	132	897	731	162
Brazil	549	263	43	112
Canada	1,734	3,509	6,728	4,068
Central America	208	.....	3	138
Chile	.....	263	153	527
China	187	2,111	184	37
Columbia	501	463	7	28
Cuba	291	246	163	186
Dutch East Indies	553	93	39	2
Finland	100	.....	.....	.....
France	.....	.....	26	.....
Greece	22	605	.....	.....
Italy	.....	1,683	548	1
Japan	76	3,115	478	33
Java	377	.....	.....	3
Mexico	677	709	249	121
Norway	94	.....	9	14
Panama	59	.....	3	106
Philippines	958	914	.....	152
Peru	95	87	35	128
Soviet Russia	.....	.....	.....	37
Turkey	.....	1,014	.....	.....
United Kingdom	.....	3	252	1,650
Uruguay	148	60	34	.....
Venezuela	189	147	8	34
Total	8,013	17,012	9,896	7,893

DESTINATION OF IRON AND STEEL EXPORTS
In Gross Tons

Country	May 1930	April 1930	May 1929
North and Central America & West Indies	102,791	94,659	150,930
Can. and Newfoundland	87,162	75,665	134,559
Cuba	3,347	4,588	5,031
Guatemala	251	271	472
Honduras	358	336	636
Mexico	7,934	8,152	6,870
Panama	708	2,534	1,170
Salvador	255	227	184
Br. West Indies	1,543	1,433	471
Other West Ind.	839	1,096	998
Other Cent. Am.	394	357	539
South America	26,586	32,427	21,665
Argentina	5,397	8,153	5,944
Brazil	3,054	4,641	4,322
Chile	4,651	9,274	2,930
Colombia	4,492	2,265	2,354
Peru	2,080	1,586	829
Uruguay	3,160	2,391	288
Venezuela	2,873	3,598	4,263
Other So. Am.	879	519	735
Europe	14,638	25,014	41,902
France	206	1,380	783
Germany	104	382	4,412
Italy	2,652	10,544	12,945
Poland and Danzig	.....	883	15,003
Sov. Russia in Europe	1,897	2,301	857
Spain	14	75	389
Sweden	607	574	248
United King.	5,123	3,959	4,649
Other Europe	4,035	4,916	2,616
Far East	49,681	53,483	46,042
Brit. Malaya	337	593	517
China	3,807	3,968	4,022
Neth. East. Ind.	4,770	2,381	1,798
Ind. and Ceylon	1,401	483	1,809
Hong Kong	217	1,118	45
Japan	27,801	35,619	29,706
Kwantung	2,615	2,295	118
Philippine Isl.	3,780	4,393	5,031
Australia	1,080	911	1,734
New Zealand	278	448	704
Other Asia and far east'n markets	3,595	1,274	558
Africa	2,424	3,057	1,790
Un. of So. Af.	364	567	817
Egypt	146	31	533
Mozambique	187	1,258	436
Other Africa	1,727	1,201	4

parison with April, scrap, tin plate, steel bars, plates and plain shapes, registered decreases. Similarly, gains were shown in skelp, plain structural shapes and car wheels and axles.

Shapes' 19,640 tons was the principal item in the May import trade, pig iron, ferromanganese and steel bars following in order. Belgium again was the chief source of iron and steel imports, exporting to this country, in all, 17,913 tons. British India followed with a total largely pig iron, and Germany was next. Imports of iron ore declined from 313,069 tons in April to 291,372 tons in May. Manganese ore and concentrate receipts rose to total 29,761 tons.

June Pig Iron Production Drops as 20 Furnaces Blow Out

Despite a reduction of 20 operating blast furnaces in June, production of pig iron dropped only 6.3 per cent in average daily rate. According to an estimate compiled by STEEL largely from telegraphic reports from iron producers, the daily rate for June was 97,972 gross tons. The rate for May was 104,564 tons and in June one year ago, 123,887 tons. Although 1928 was a more normal year than 1929, the June, 1928, rate of 104,564 tons a day was over 6500 tons better than the rate of last month. Rates in May of 1930 and 1928 were almost on a parity, with 1928 having a slight advantage over 1930.

Active stacks on May 31 totaled 180; by June 30 this number had been pared down to 160, the curtailment being equally as precipitous as that of last December when the total was reduced from 176 to 156. For four consecutive months operations have been scaled down from a high point of 184 furnaces to 160, a total but 4 better than the 156 making iron at the close of December.

Coke pig iron produced in June amounted to 2,939,172 gross tons, or 302,305 tons less than the 3,241,477 tons made in May. This loss was 9.3 per cent, but it must be remembered that June was a one-day longer month than May. The production was 775,932 tons below the 3,715,104-ton output of June last year, but only 143,168 tons under the 3,082,340 tons in June, 1928. In the first six months of this year production has been 18,309,278 tons, against 21,637,537 tons for the first half last year and 18,510,463 tons in 1928.

Operations in June, based on the ratio of production to annual capacity, were 69.5 per cent. The figure for May was 74.2 per cent. Operations were the lowest since January, when the figure was 65.0 per cent.

Of the 20 stacks blown out or banked in June, 16 were of nonmerchant or steelworks classification and 4 were merchant. Five each were blown out in Ohio and Pennsylvania; 3 each in Illinois, Indiana and Alabama; and 1 in Tennessee.

AVERAGE DAILY PRODUCTION

	1930	1929	1928	1927
Jan.	91,573	110,742	92,113	100,043
Feb.	101,640	114,942	99,954	105,021
Mar.	104,930	119,662	103,199	112,326
Apr.	106,371	122,106	106,066	114,146
May	104,564	125,753	106,219	109,388
June	97,972	123,887	102,745	102,991
July	.....	122,016	99,120	95,311
Aug.	.....	120,845	101,193	95,183
Sept.	.....	116,548	102,120	92,750
Oct.	.....	115,747	108,824	90,710
Nov.	.....	106,081	110,155	88,728
Dec.	.....	91,513	108,702	87,039
Ave.	101,156	115,808	103,365	99,422

MONTHLY PRODUCTION

	1930	1929	1928
Jan.	2,838,751	3,433,028	2,855,515
Feb.	2,845,937	3,218,376	2,898,668
Mar.	3,252,822	3,709,518	3,199,175
April	3,191,119	3,663,167	3,181,975
May	3,241,477	3,898,344	3,292,790
June	2,939,172	3,715,104	3,082,340
Total 6 mos.	18,309,278	21,637,537	18,510,463
July	.....	3,782,511	3,072,711
Aug.	.....	3,746,198	3,136,995
Sept.	.....	3,496,454	3,063,593
Oct.	.....	3,588,146	3,373,539
Nov.	.....	3,182,420	3,304,656
Dec.	.....	2,836,917	3,369,784
Total	.....	42,270,183	37,831,741

	No. in blast last day of month		—Totals—	
	June	May	June	May
Ohio	35	40	657,779	706,393
Penn.	53	58	888,760	988,103
Alabama	14	17	211,531	240,532
New York	13	13	205,829	200,568
Illinois	15	18	330,176	358,579
Colorado	2	2		
Indiana	11	14		
Maryland	4	4	417,304	498,757
Virginia	1	1		
Wisconsin	0	0		
Kentucky	1	1		
Mass.	1	1		
Tennessee	1	1	106,730	116,683
Utah	1	1		
West Va.	3	3		
Michigan	4	4		
Minnesota	2	2		
Missouri	0	0	87,763	91,828
N. Jersey	0	0		
Spiegel and ferro all states	....	....	33,300	40,034
Total	160	180	2,939,172	3,241,477

Industrial Men in the Day's News

G. D. Spackman, President, Lukenweld Inc., Coatesville, Pa.

ATTENTION over a period of years to the problem of bringing mill production of welding steel into line with trade practices, fits him adequately for his new position.

GRADUATING from college 13 years ago he now heads a new subsidiary of Lukens Steel Co.

FUEL engineer, superintendent of the flange department and assistant general superintendent, have been his three previous positions.

ONLY 13 years after receiving his degree in mechanical engineering from Swarthmore college, Swarthmore, Pa., G. D. Spackman of Coatesville, Pa., has attained the rank of president. As noted in IRON TRADE REVIEW of June 19, he was chosen to discharge the duties of that office for Lukenweld Inc., a new subsidiary of the Lukens Steel Co., Coatesville, Pa., recently organized.

During the past few years Mr. Spackman has devoted the greater portion of his time to the solution of the problem of mill production of welding quality steel. His election to head the new company comes as a recognition of his outstanding achievements in bringing mill practice into line with trade requirements for welding quality steel. The new subsidiary interest was organized to manufacture welded steel assemblies for machinery and equipment builders, with which class of trade welding is making rapid strides.

Mr. Spackman will be in direct charge of the 50,000 square feet of manufacturing floor space in the Lukens Steel Co. plant devoted to the work of the new company and will have jurisdiction as well over the 24 operators working at the present time, to which number 30 or more additional will be added within 60 days.

Mr. Spackman received his A. B. degree from Swarthmore college and his M. E. degree in 1917. He was employed shortly thereafter by Lukens Steel Co. as fuel engineer. He next was appointed superintendent of the flange department and later was made assistant general superintendent.

RAY T. BAYLESS, associated since 1922 with the American Society for Steel Treating, Cleveland, as editor of its *Transactions*, has been promoted to assistant secretary. He has been placed in entire charge of the society's technical activities, and will continue to have entire responsibility for editing and publishing various papers on research and investigation. He also will publish *The Review* of American Society for Steel Treating and have charge of program preparation.

Mr. Bayless was born in Amityville, Long Island, N. Y., and graduated from the University of Michigan in 1914 with a degree of bachelor of chemical engineering, having majored in metallurgy. He was successively employed by Michigan Smelting & Refining Co., General Motors Corp. Research Laboratories, Chalmers Motor Co., and Saxon Motor Car Corp. During the World war he became associated with the ordnance department as supervisor of tests of all materials used in ordnance manufacture in the Cleveland district. After the armistice he became affiliated with James H. Herron Co., Cleveland, consulting engineer.

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John G. Benedict, treasurer and general manager, Landis Machine Co., Waynesboro, Pa., was recently elected trustee of Pennsylvania State college.

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P. H. Noland has resigned as vice president of Minneapolis-Moline Power Implement Co., Minneapolis, to join the Marmon Motors Corp., Indianapolis, as vice president.

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Walter Rushford, traffic manager for W. S. Tyler Co., Cleveland, was recently elected president of the Traffic Club of Cleveland.

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Ray H. Moore, since 1926 manager of the equipment division, Whiting Corp., Harvey, Ill., has been appointed Cleveland district manager.

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J. L. Van Nort has been promoted to sales engineer at the Boston office of Reliance Electric & Engineering Co., Cleveland, manufacturer of electric motors.

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David Bartlett, after an absence of

several months, has been appointed Chicago manager for the Alexander Milburn Co., Baltimore, manufacturer of welding and cutting equipment.

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L. J. Byrne, 9 South Clinton street, Chicago, has been appointed representative in the Chicago territory of the Magnetic Mfg. Co., Milwaukee, effective July 1.

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Charles E. Seeley, formerly with the wire goods division, Wickwire Spencer Steel Corp., Worcester, Mass., has been made superintendent, Gatch Brush & Wire Goods Co., Baltimore.

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Werner Finster, formerly foundry metallurgist of Deere & Co., Waterloo, Iowa, now is technical supervisor of foundry operations, Reading Steel Casting Co., Reading, Pa.

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Ferd Hicks, purchasing agent, Wyatt Metal & Boiler Works, Dallas, Tex., was elected first vice president of the Dallas Purchasing Agents association at its recent annual meeting.

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W. M. Brooks, president and assistant treasurer, E. J. Brooks Co. Inc., Newark, N. J., continues as president and succeeds the late E. J. Brooks as treasurer. The latter's position of chairman will be left vacant for the present.

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Rudolph E. Hellmund, chief electrical engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was awarded the B. G. Lamme award for 1929 at the recent Toronto, Ont., meeting of American Institute of Electrical Engineers.

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John A. Rendle, Toledo, O., was re-elected president Sterlite Foundry & Mfg. Co., Auburn, Ond. Richard J. Schweitzer, Chicago, is vice president and A. L. Kuhlman, Auburn, is general manager and secretary treasurer.

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R. L. Davis, formerly engineer in charge of radio development for the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been made manager of the radio engineering department of that company at Chicopee Falls, Mass. V. E. Trouant succeeds him at East Pittsburgh.

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George E. J. Pistor, sales engineer, Hay Foundry & Iron Works, New York, and treasurer, American Institute of Steel Construction, sailed July 3 for a 2-month European tour. He will represent the institute at a number of meetings while abroad, being scheduled to deliver addresses July 18 at the hall of the Institute of Mechanical Engineers, London, and July 21 at a joint meeting of the Royal Institution of Engineers and the Association of Dutch Architects at the Hague, Holland. He also will speak July 23 at Dusseldorf, Germany, as guest of Stahlwerks-Verband, A. G., and on Aug. 20 will address the French structural steel interests at Paris. He will attend the International Congress of Steel Construction at Liege, Belgium, Sept. 1.

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Lester B. Knight, formerly with Illinois Clay Products Co., Chicago, now is sales engineer, National Engineering Co., Chicago. He is a graduate of Cornell university and has done considerable research work on sand and rebonding clays.

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W. W. Peacock, formerly with Pittsburgh offices, Niles Tool Works and Motch & Merryweather Machinery Co., has become associated with the machine tool department of Joseph T. Ryerson & Son Inc., Pittsburgh.

Photo by Bachrach, Inc.
RAY T. BAYLESS

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B. C. Heacock, formerly vice president, Caterpillar Tractor Co., Peoria, Ill., has been made president, succeeding R. C. Force, president since the corporation's organization. The latter now becomes chairman of the executive committee.

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E. A. Balsley resigned July 1 as vice president in charge of operations, Wheeling Mold & Foundry Co., Wheeling, W. Va. Following his graduation from the University of Wisconsin in 1902, Mr. Balsley spent 21 years in various positions with American Bridge Co. When he left the American company in 1923 he was operating manager of the western district. For about three years he engaged in consulting engineering practice in Chicago, on plant rehabiliation work. In 1926-1927 he was works manager for Van Dorn Iron Works, Cleveland, since which time he has been works manager, vice president and production manager for Wheeling Mold & Foundry Co. He has been active in various organizations connected with the foundry industry and with the engineering profession.

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L. F. Bomhoff, assistant comptroller and secretary-treasurer, Jaxon Steel Products Corp., Jackson, Mich., has resigned, effective July 15. W. R. Forsythe, formerly with Armstrong Spring Co., Flint, Mich., likewise a General Motors Corp. subsidiary, succeeds him.

May Statistics Show Losses

(*Concluded from Page* 33)

ended June 21, bureau of mines reports. Output compares with 7,986,000 tons for the prior week. Thus far in 1930, production of 221,050,000 tons is 10 per cent under 1929.

Steel Barrels Drop Further

Cleveland—Steel barrels totaling 502,188 were shipped during May, by report of the Steel Barrel Manufacturers' institute. Production, at 44.2 per cent of capacity, averaged 45,500 units daily. Output stood at 46.2 per cent in April and shipment of 511,866 units was recorded.

Worcester Foundries Down

Worcester, Mass.—Worcester, Foundry council, comprised of 11 foundries, reports castings production for May at 3,261,695 pounds, a decline from April of about 2 per cent. Five-month totals for 1930 lag 34 per cent behind 1929, as shown:

1929	
May	5,231,926
Total (5 mos.)	23,375,642
June	4,199,102
July	4,192,693
August	4,869,912
September	3,946,064
October	4,456,646
November	4,108,685
December	2,819,796
Total, 1929	51,968,540
1930	
January	2,862,705
February	2,786,850
March	3,160,872
April	3,337,292
May	3,261,695
Total (5 mos.)	15,407,414

Common stock of the National Steel Corp., formed last year through a merger of the Weirton, Hanna and Great Lakes companies, is now listed on the New York stock exchange.

Employment Index Shows Work Is Well Distributed; Wage Rates Steady

AMERICAN industry has been operating in the past six months in accordance with a modern wage and employment philosophy, and the experiment apparently has been working out more satisfactorily than if it had followed the old custom of ruthless dismissal and wage rate reductions in time of stress. Manufacturers have been trying to solve the problem by keeping their labor forces intact—on the payroll—maintaining wage rates, and reducing the number of hours. The effect has been to lighten the hardship by distributing it evenly, or as uniformly as possible. Another result has been to apportion earnings among a larger number of workers.

"We are holding all our men and paying them the same rates as last year, but our work is limited to three or four days a week," said the manager of an Ohio steel specialties plant, normally employing 3000 persons. "This method has proved far superior than keeping a relatively few employed all the time."

Inquiries indicate this plan is general, where consistent with the class of operations. That it is being followed in the iron and steel industry is indicated by employment statistics compiled by the bureau of labor.

The index of iron and steel employment so far this year does not show a severe setback from the average of 1929. That average was 94.7, with 1926 representing 100. During the busiest months last year this barometer of employment went up to 97. The year ended with the pointer at 87.5. January brought a slight recovery. A further gain was registered in February, with the index at 90.8. It has not varied from this level by as much as 1 per cent through March, April, May and June.

The average for the first six months, June estimated, is 90, only 4.7 points below that for all of 1929. Iron and steel industry is operating at 66 per cent, compared with 95 a year ago. Average rate so far this year has been at least 25 per cent under the comparable period of 1929, but the employment index for the first six months this year is only 5.4 per cent below first half of 1929.

The explanation of this discrepancy is that the employment index indicates the regularity or continuity of employment, but does not show the change in actual hours or days of labor. The data refer to the number of employes on payrolls,. The industry is distributing its work, giving as many of its regular employes as possible something to do, a chance to share in the distribution of wage earnings. With few unimportant exceptions, wage rates have not been reduced, though per capita earnings are lower than in 1929.

Republic's Blast Furnaces on 8-Hour Day Basis

An 8-hour day for its employes at blast furnaces and coke ovens in the Birmingham, Ala., district has been declared by the Republic Steel Corp. A three-shift plan has been adopted to provide work for as many employes as possible during a period of light operations. The corporation eliminated the 12-hour day some time ago and no employe works more than six days in a week. Coke oven and blast furnace men now will work 48 hours a week.

Obituaries

LEROY A. MANCHESTER, 47, chief counsel since late 1917 for Youngstown Sheet & Tube Co., Youngstown, O., died June 27 as the result of gunshot wounds, self-inflicted. Nervous strain and overwork incidental to the Sheet & Tube-Bethlehem merger trial were given as possible causes for the act. Mr. Manchester was born in Canfield, O., May 6, 1883, and was graduated from Northeast Ohio Normal college in 1902. Three years later he was graduated from University of Michigan's law school, and practiced law in Detroit with his brother. He then removed to Youngstown, being admitted to the law firm of Aree, Wilson & Harrington. Sept. 1, 1907, he became a member of the legal firm, Hine, Kennedy, Robinson & Manchester, and chief counsel for Sheet & Tube on Dec. 1, 1917.

Photo by Blank-Stoller Inc.
LEROY A. MANCHESTER

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Richard W. Alexander, treasurer, Poole Engineering & Machine Co., Baltimore, and formerly associated in an executive capacity with the Equitable Trust Co., Baltimore, died June 19.

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John B. Schmandt, formerly with the Schmandt Foundry Co., Detroit, died recently.

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A. Livingston Mason, former president, Newport Engineering Works, Newport, R. I., and a retired broker, died June 25 at Bronxville, N. Y.

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Laurent B. Levy, 60, president, Pennsylvania Range Boiler Co., Twenty-fourth and Washington streets, Philadelphia, died suddenly at his home in that city June 5.

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Henry Tscherning, 69, for many years chief engineer of Arcade Mfg. Co., Freeport, Ill., molding machines, died June 8. Mr. Tscherning was connected with the Arcade company continuously since 1896.

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Benjamin F. Haughton, 80, vice president and former treasurer, United States Pipe & Foundry Co., East Burlington, N. J., died June 25 at his home, Beverly, N. J., after a brief illness. Mr. Haughton was a native of Cincinnati and had been with the United States company since its organization in 1899. During that interval great progress has been made by the foundry at Burlington, N. J. Mr. Haughton was active in introducing the DeLavaud system, not only at Burlington, but in other foundries and several plant additions were constructed during his connection with the company. He was one of the organizers of the Burlington chamber of commerce and a former president of that organization. He was also a director of the Burlington City Loan & Trust Co. and a member of the Deeper Water Ways commission.

Here and There in Industry

MILWAUKEE CORRUGATING CO., Milwaukee, has changed its name to Milcor Steel Co., embodying its established trade name in its title. Its output has been extended to a point where a large proportion is of material not corrugated. The company was founded in 1902 and has grown steadily, acquiring other plants in five cities. No change is to be made in the management or policies. L. Kuehn is president and A. J. Luedke is secretary and treasurer.

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Ryan Valve Co., Westfield, Mass., has started manufacture of safety valves, occupying space in the plant of the Ensign Box Co.

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Federal Steel Corp., Detroit, has opened a branch at 3900 West Thirty-eighth street, Chicago. Stocks of steel sheets, plates, bars and strip will be carried.

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Kingston Products Co. and Kokomo Stamped Metal Co., both of Kokomo, Ind., have been consolidated and will occupy the plant of the former. Both are owned by the same interests.

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Ross Heater & Mfg. Co. Inc., Buffalo, has moved its Chicago office to 20 North Wacker drive, room 1518. S. Wolff is district manager; R. E. Allen is sales engineer.

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Anthony Lashier Co. has purchased assets and plant of the Read-Coddington Engineering Co., both of Buffalo, and will consolidate the two corporations. The latter company will withdraw from the construction field.

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Pittsburgh Tube Co., Pittsburgh, has opened a New York district sales office for the sale of standard pipe at 210 East Forty-fifth street, in charge of John G. Kelly, district sales manager.

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Frecker Bros. Inc., 30 Church street, New York, has been appointed representative of N. A. Strand & Co., 5001 North Lincoln street, Chicago, and will handle flexible shafts and equipment in eastern New York and northern New Jersey.

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Great Lakes Boat Building Corp., Chicago, has been organized to take over a former company of the same name, with a boat building and repair plant at 3250 Washtenaw avenue. Henry C. Grebe, manager of the former company, will be identified with the new organization. Expansion is planned.

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General Refractories Co., Philadelphia, has moved its Detroit sales office to 2328 Union Trust building.

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Stupp Bros. Bridge & Iron Co., 3800 Weber road, St. Louis, has consolidated its contracting office with its general office to promote co-ordination of effort. Part of its former offices at 1605 Syndicate Trust building will be retained as downtown headquarters.

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A. M. Byers Co., Pittsburgh, is installing new equipment at its Ambridge, Pa., plant for production of wrought iron by the Aston process. Formal opening is expected around the latter part of July. Most of the iron-producing facilities are completed but rolling equipment is not yet ready for operation.

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General Dry Batteries of Canada Ltd., Toronto, Ont., a branch of General Dry Batteries Inc., Cleveland, has established a plant at 1244 Dufferin street for the manufacture of cells and batteries. The company has taken over the business of the Dominion Battery Co.

□ □ □

Superior Charcoal Iron Co., Grand Rapids, Mich., has taken over complete sales of charcoal pig iron produced by the Newbury Lumber & Chemical Co., Newberry, Mich. Newberry stack formerly was operated by the Charcoal Co. of America. This addition gives the Superior Charcoal Iron Co. three stacks with annual production capacity of 100,000 tons of charcoal iron.

□ □ □

Pottstown-Sotter Tank Works Inc., Pottstown, Pa., has been organized by interests which recently bought the plant of Sotter Bros. Inc., manufacturer of steam boilers. Officers are: President, P. E. Reynolds; vice president, G. W. Wilmont; vice president and general manager, R. L. Major Jr.; secretary, S. W. Croll; treasurer, J. C. Hoffman; assistant treasurer, W. F. Otto.

□ □ □

Parsons Engineering Corp. has been organized to succeed the Parsons-Thompson Engineering Co., Cleveland. Officers are: President, S. S. Parsons; vice president, George Walzer; assistant vice president, Robert Wisely; treasurer, O. C. Sabin; assistant treasurer, F. C. Morey; secretary, Peter Reed; assistant secretary, C. W. Scott. Parsons-Thompson Engineering Co. has been western sales agent of New Haven Sand Blast Co., New Haven, Conn., and has specialized in design and manufacture of special foundry and cement mill equipment.

□ □ □

Atlas Engineering Works, Houston, Tex., expects to move into its new plant at 5200 Navigation boulevard, about July 1. Ernest L. Barker is manager. The company specializes in manufacture of oil field and refinery equipment.

□ □ □

Caldwell Welding & Machine Works, Houston, Tex., has been organized by Cecil Caldwell, formerly with Kreiter Gear & Machine Works, Houston. The company has leased a building at 1911 Franklin avenue and will specialize in electric welding and general machine work.

□ □ □

Southern Brass Mfg. & Plating Co., Houston, Tex., has added a hot galvanizing unit to its plant and has incorporated this department as the Hot Dip Galvanizing & Tinning Co. Thomas M. Adams is general manager.

□ □ □

Duraflex Piston Mfg. Co., 3215 Bowen street, Dallas, Tex., has been organized to manufacture automotive and gas engine pistons. It is a successor to the Allsup-Weed Co., formerly at the same address. L. M. Manley is president and general manager.

□ □ □

Hirsch Steel Co., Houston, Tex., has taken over the Willborg Boiler & Sheet Iron Works, 2300 Nance street, following the recent death of Mr. Willborg, and has installed additional equipment for fabrication of structural steel in addition to plate and sheet iron work. Edward Hirsch is president and general manager.

□ □ □

Standard Day-A-Nite Co., of Houston, Tex., has been organized to manufacture oil field equipment as a result of the consolidation of the Standard Machine Works and Day-A-Nite Mfg. Co. Present offices and plant are at 1212 Nance street. J. C. Bradshaw is president and A. E. Anderson is vice president and general manager.

□ □ □

Harnischfeger Corp. of Canada Ltd., recently established at Ottawa, Ont., has opened an office at 504 Dominion Square building, Montreal, Que., in charge of L. P. Deephouse, district manager. The company is Canadian distributor for the excavating equipment, cranes and hoists of the Harnischfeger Corp., Milwaukee.

MIRRORS of MOTORDOM

DETROIT

BACK of automobile manufacturers as they cross the threshold of the third quarter is a solid first half year's accomplishment. Compared with the alltime record of 1929, first half production represents a big decline, of course—about 1,00,000 in units and 33 1/3 in per cent. But over the first halves of 1928 and 1927, considered normal, a slight gain actually was registered.

This showing, however, is so much water over the dam. The automobile industry is looking only one way these days, and so far as it can see, which is to Sept. 1, it can discern nothing cheering. June's 10 per cent decline in production from May will be smartly increased this month, and August at this distance looks little, if any, better than July.

Technically, the position of the automobile industry is good. Dealers' stocks of new and used cars are not overly large. Rarely has the industry offered more, mechanically or in appearance. The vacations of July and August — euphonistic synonym for enforced shutdowns—amount to artificial restriction of production. But technical positions produce no cars, and the industry is production hungry.

Ford Begins $8,000,000 Vacation Next Week

When Ford workmen lay down their tools Friday night, July 11, they begin an $8,000,000 vacation. Until Monday, July 28, production at Fordson will be at a complete standstill, and with about 100,000 men off the payroll, Ford will save about $800,000 every working day.

From a peak of 9500 units daily, attained several times late in May, Ford operations have shrunk to about 8300 daily, on the basis of a double shift 5 days a week. During July and August Ford has scheduled 34 working days and expects to average 7000 units a day. For these two months Ford output will be about 235,000 units, compared with about 190,000 in May alone.

Material and parts now being taken in at Fordson represent a minimum of requirements, and inventories July 11 will be the lowest since Model A was put on the line. During the shutdown considerable plant rearrangement will be attempted and the enlarged power house will be brought in. Among new equipment is a 110,000 kilowatt turbo-generator, bringing the capacity of the power house to 150,000 kilowatts.

Chevrolet on 3-Day Week; Will Hudson Change?

Chevrolet, which assembled 85,000 units in June, or about 25,000 fewer than in May, has curtailed its daily rate to about 3500 units and is shortening its work week from 5 days to 3. At this time it appears that this reduction in schedule will obviate a complete shutdown, such as Ford is undertaking.

The Chevrolet 1930 line may be withdrawn from production earlier than usual. Normally, late October, November and early December are periods of retooling and changeover. Fisher Body expects to complete its run on Chevrolet bodies shortly after Sept. 1, which may indicate an earlier cessation of assembly than usual.

Chevrolet's heavy emphasis upon the six-cylinder motor is believed to insure continuance of the six line into 1931.

◆

Hudson-Essex is on vacation this week and next. It has been said that the assembly line on Hudson as well as Essex will start up Monday, July 14, but there are rumors which raise a doubt.

Hudson has not been selling well this year, even considering the general slackness in the retail market. For one thing, when Hudson took some of the top speed off the old six and put it into added acceleration in the new eight it lost some of its long-established clientele.

For smart merchandising, a good many in Detroit give the palm to Hudson-Essex. In the past, when a model did not go over well, it has been swift to withdraw it and try something new. In a few weeks Buick and Chrysler both will have new eights in the market, and it would be contrary to past experience to expect Hudson to meet this competition sitting down. So, despite factory denials, Hudson-Essex is being watched.

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Buick went into production June 10 on its new line of eights—generally expected to be three ranges of straight eights, at least two of which will have overhead valves—and formal announcement is scheduled about July 20.

Present production approximates 1000 units daily, which compares with about 300 daily on the old 1930 line and a plant capacity of about 1400. Through July at least, Buick is slated to operate strongly.

Chrysler also is swinging into production on its two new eights, but does not give the impression of virility that is obtained from Buick. Its July schedule for the new line is 12,000 to 15,000 units.

On the Chrysler six and Plymouth four the daily rate still is about 800. Dodge at 325 a day, 5 days a week, is down somewhat, as is DeSoto at 250 a day, 4 days.

Schedules of Most Makers Showing Curtailment

Willys-Knight at 550 to 600 a day, 4 days, shows a slight reduction. So do Olds, at 300 a day, 4 days; Gra-

ham at 200 a day, 5 days, Cadillac-LaSalle at 100 a day, 4 days, and Packard at 115 a day, 5 days. Hupp is little changed at 125 to 130 a day, 5 days.

Pontiac-Oakland now is down to about 300 of the sixes and 150 of the eights, 4 days a week. Of producers outside the Detroit district, Nash is averaging 350 a day, 5 days; Studebaker 310 a day, 4 days; and Auburn 75 a day, 5 days.

Graham has stated there will be no midyear model changes. Reo is due for a change. Willys-Knight has a new lower-priced Knight in the market.

Continental Motors is on vacation this week and next. White Motor, at Cleveland, is to be down two weeks beginning Aug. 11.

July Production To Be Low; August Looks Dull

Taking into account these curtailments and shutdowns, or rather vacations, a severe recession in production is in store for July.

The 1929 slide in production hit bottom at 120,000 units in December. January showed a slight gain to 275,000 units, February moved up to 346,000, March advanced to 401,000 and April scaled the peak at 442,000.

May developed a decline to 417,000. June is estimated at 350,000 to 375,000. If July in the face of the Ford and Hudson shutdown and the curtailed Chevrolet work week stays above 300,000 units it will surprise many observers. August is doubtful; Ford will be operating full time and may hold the month's total close to July's.

First half year output for 1930 was 2,250,000 cars and trucks, compared with 3,225,000 for 1929, 2,200,000 for 1928, 2,070,000 for 1927.

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Labor at many automobile plants has been on short rations, financially speaking, all year. The short work weeks have made pay envelopes leaner by one to three days each week, while in some cases rearrangement of facilities and of tasks has brought reduced hourly rates.

Clerical forces are now beginning to feel the pinch. At some plants the 5-day week has been in effect while weekly salaries have been unchanged. Now, the 5-day week with 5-day pay is appearing, being in effect a salary reduction of 1/11. It is understood that such a revision has been made by Packard and Oakland-Pontiac, and possibly also by Chevrolet.

Executive forces were severely curtailed immediately after the stock market crash last fall. Automobile purchasing is peculiarly at the mercy of individual buying power and Detroit's view of the last half year is less rosy the more thought dwells upon the 5-day week with only 5 days' pay.

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Considering the new Buicks as straight eights, it is increasingly evident that General Motors faces a stiff problem in marketing this type in view of the euconiums it has heaped upon the V-type eight.

Of course, General Motors has always maintained that it has an open mind in its laboratories, but in the public mind there has been a contest between General Motors and its V-type eights and other manufacturers with their straight eights.

Purely by way of speculation, many have believed a contribution could be made to the present disturbed retail situation if there were a pruning out of many models. General Motors in the past two years has inserted the Viking, Marquette—now a memory except for the cars still on dealers' floors—and the Cadillac sixteen into its line, while Chrysler, Graham and Hupp all have broadened in order to tap various sizes of purses.

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When Buick brings out its straight eight in the price range of the former Marquette, and two eights in the present Buick classification, it will be in direct competition with the Oakland V-eight at the lower reach of this spread and with the Viking V-eight at the upper reach. Neither Oakland nor the Viking has been a big seller or a big moneymaker. There is some wonderment as to what will happen.

General Motors is effecting economies through standardization of many body parts. Chevrolet and Pontiac make one couplet having few differences in size and lending themselves to standardization, while Oldsmobile and Oakland form another.

Relatively speaking, major effort of Chrysler engineers the past year or so has been devoted to the DeSoto six and eight, and a good many parts of these models are standard on other Chrysler lines. One of the big economies Hudson-Essex counted upon in 1930 was an interchange of Hudson and Essex parts to about 40 per cent of the total.

New Models Quicken Some Body Plants

Body manufacturers are busy according to their connections. Fisher Body's best account now is Buick and Cadillac sixteen, but on other General Motors lines curtailment has been ordered. Briggs is active on the new Chrysler but slowing down on Ford. Murray also is tapering off on Ford business but is working on a new Reo job.

The radiator on at least one of the new Chrysler eight models has a bulge, resembling more the Cord radiator than any other now on the road.

Parts orders for the new Austin bantam, being assembled at Butler, Pa., are on the basis of 15,000. In the rough, the block of the four-cylinder Austin engine weighs 29 pounds, the cylinder head 12 pounds and the exhaust manifold 6 pounds—a total rough weight of 47 pounds for the entire engine.

Auto Industry Produces 1,200,000 Tons of Scrap

Automobile manufacturers who in 1929 accounted for 85 per cent of all passenger cars, trucks and busses made, had a by-product of about 835,000 gross tons of iron and steel scrap, indicating a total automobile scrap production of 1,200,000 tons, a survey by the Institute of Scrap Iron and Steel reveals.

In the assembly of some of the larger cars about 1000 pounds of scrap results, but the average for the entire industry is placed at 400 pounds per car. Ninety per cent of the industry's scrap is disposed of through dealers. Buffalo mills take about 200,000 tons of scrap from Detroit annually; the remainder largely goes by rail to the Pittsburgh and Youngstown districts.

The companies reporting, and forming 85 per cent of the industry, last year sold 235,279 gross tons of hydraulic compressed bundles, 192,788 tons of machine shop turnings, 80,543 tons of flashings, 75,358 tons of mixed borings and turnings, 67,433 tons of short shoveling turnings, 43,959 tons of cast iron borings, 28,460 tons of shoveling steel, 17,240 tons of sheet clippings, 14,116 tons of No. 1 busheling, 11,408 tons of heavy melting steel, 2517 tons of No. 2 busheling, and 65,000 tons miscellaneous.

◆

Dodge claims added strength for its frame by making the lower flange of the main side members longer than the upper and kinking it to give the effect of angle plus a Z bar. . .Ford is reopening his Cambridge, Mass., assembly plant for commercial vehicles, having a daily capacity of 150. . .Chrysler asserts there is more steel, in relation to total weight, in the body of its new low-priced six than in any other automobile body. . .It was an error, of course, in the June 5 issue to say that Chevrolet No. 6,000,000 was assembled June 25, 1919; the year should have been 1929. . .Those bargains in 1929 Oaklands and Pontiacs are part of the factory's campaign to move the 20,000 cars unsold when the 1930 line was brought out.

EDITORIAL

The First Billion Is in the Bag; Now for the Second!

STEEL has been manufactured in the United States for more than a century, but half of all that has been made is the product of the past 12 years. From 1810 until the end of 1929 the total output of steel was 1,020,061,154 tons, more than 500,000,000 tons of which was produced since 1917.

Measured by decades, steel did not make as spectacular a showing during this 12-year period as in the preparatory stage, when its value was just beginning to be recognized. For example, in the ten years 1890 to 1899, production was three times that of the preceding ten years. In the decade 1900 to 1909 the tonnage again tripled. For the period 1910 to 1919 it was approximately twice that of the preceding decade, and in 1920-1929 the increase was slightly more than 20 per cent.

In the earlier decades when steel was trebling and doubling its output, new and great industries were being developed and becoming dependent on this material. Later, when primary outlets for steel were established it was natural that the ten-year increase in production should be less sensational than when they were presenting insatiable demands.

Between 1890 and 1900 the per capita output of steel in the United States increased 97.4 per cent. A still greater gain, 111 per cent, occurred between the years 1900 and 1910, the period when the automotive industry was getting into its stride. From 1910 to 1920 the gain was 40 per cent, and from 1920 to 1929 it was 16.6 per cent. The increases in the country's population in these periods were, respectively, 20.7 per cent; 21.3 per cent; 15.5 per cent, and 14.2 per cent. It is obvious that population has not been the all-important factor in the rise of steel production; rather, it has been the broader utilization of steel, first for essentials and then for luxuries which later become essentials.

Recognize Steel as Basic To Industry

The period of stability, or establishment of steel beyond question as the fundamental material, was reached a dozen years ago, with the production at a half billion tons. What followed thereafter, leading to the output of another half billion tons, was mainly due to a wider, deeper recognition of the inherent merit and advantages in the use of steel.

American ingenuity has amazed the world and as new devices and products have been developed their originators have turned instinctively to steel. Can it be made of steel, is one of the first tests applied to new articles intended for large and economical distribution. For every loss to a substitute for steel, hundreds of new uses have sprung up to take its place. For every man, woman and child living in the United States there has now been produced approximately 18,816 pounds of steel, contributing in some measure directly or indirectly to his or her welfare.

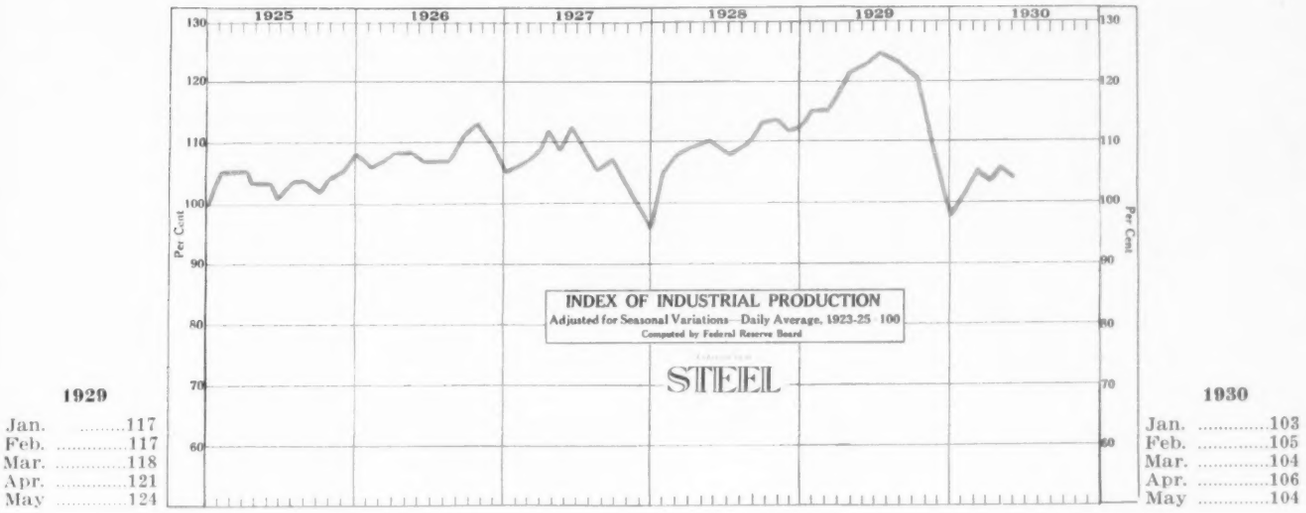
Will the American people continue to show this pronounced leaning to steel? Production ten years hence cannot be projected from any basis which includes those decades in which tonnages were trebled or doubled. They were steel's awakening period. The expansion over the last ten years probably affords a better glimpse into the future. If this rate of increase is maintained, the close of the present decade will see an annual output of more than 65,000,000 tons.

Extending Markets Is Immediate Task

This figure is not too much to expect, considering the requirements of major consuming industries. The National Association of Flat Rolled Steel Manufacturers recently completed a survey revealing a potential market of more than 161,000,000 tons for flat rolled steel in ten important fields. Engineering progress and inventive ingenuity can be relied on to enlarge the scope of steel.

The ubiquity of steel, the superlative service it renders and its economy inspire a feeling of confidence in its future. Over-confidence and self-satisfaction are the only dangers that loom ahead. Steel must be prepared not only to hold its own markets against invading competition by other metals and materials, but must also press forward aggressively for every advantage wherever it may be found. Steel's foundation has been laid in this first billion tons; it should be easy to maintain its prestige and lead by a display of a little more acumen and energy than some of its competitors can bring to the contest.

THE BUSINESS TREND



1929	
Jan.	117
Feb.	117
Mar.	118
Apr.	121
May	124

1930	
Jan.	103
Feb.	105
Mar.	104
Apr.	106
May	104

Industry Drifting To Lower Level of Activity

AS BUSINESS enters the month of July, the attitude of industrial leaders toward future prospects is characterized by a slightly more optimistic tone. This is not based on positive evidence of improvement, but on the conviction that conditions cannot become much worse. It is believed that in most lines, production has been kept fairly well within the bounds of demand. Commodity prices, still swinging downward, are not causing as much concern today as they were several months ago because it is felt that the turn is nearer at hand.

Industrial activity, as measured by the index compiled by the Federal Reserve board, declined again in May. In almost every major branch of industry, the rate of operations is either slipping off slightly or fluctuating up and down from week to week in an uncertain manner. In the case of the automobile industry, where unusual efforts have been made to avoid over production, July and August will be rather quiet months.

Diminished Activity Is Not Unfavorable Factor

This picture of industry idling along at reduced speed is not necessarily a gloomy one. The very curtailment, in most cases, represents strict adherence to actual demand, which means that when orders begin to pick up, they will be filled from production and not from stocks.

Weakness of commodity prices has been one of the most disturbing elements of the business situation. Several months ago, continued declines occurring in a period when many observers were looking hopefully for early signs of stabilization, seriously underminded business confidence. Today, these declines appear in a more favorable light, as it is now believed that the more thoroughly all elements of inflation are squeezed out, the more sound will be recovery when it arrives.

Quotations of steel, iron, copper and a number of other basic materials are slightly lower, but the dips are not as pronounced. Authorities are pointing to the fact that in many lines, prices are so near to actual production costs that further marked reductions are not probable.

Paving Way for Sound Recovery Later in Year

The general outlook has not changed during the past few weeks. Employment is following production of a gently falling curve. Construction, while improving, is not up to expectations. Railroad traffic, which recovered from the last holiday as sharply as in past years, has not held its gains as convincingly as heretofore. Low money rates still prevail, and as yet wages have in most cases been maintained.

Among the disturbing elements is the erratic stock market, but here again there is a measure of comfort in the thought that the present wave of liquidation is storing up strength for the future. The condition of foreign trade is being closely scrutinized. Declining exports and imports are not unexpected, but it is too early to ascribe any changes to the new tariff.

Everything seems to point to continued quiet in July and August. In the meantime, strict curtailment now will enhance the chances for sound recovery in the fall.

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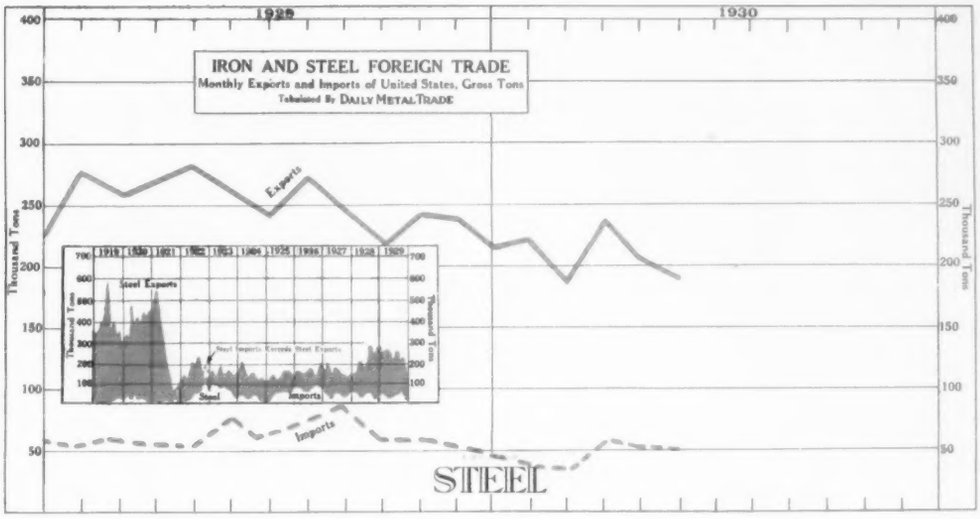
AMERICAN SOCIETY FOR STEEL TREATING

Exports

May,	1930	196,120
Apr.,	1930	208,640
May,	1929	261,516

Imports

May,	1930	52,297
Apr.,	1930	52,650
May,	1929	74,272



Exports and Imports of Steel and Iron Still Slipping

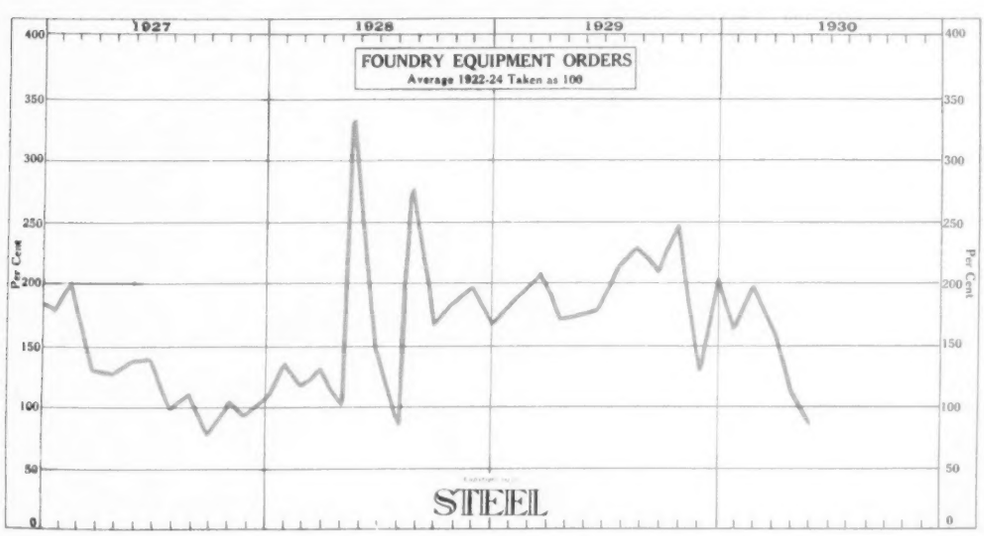
Iron and steel foreign trade is still following the downward trend that started in the early part of 1929. According to the preliminary reports of the department of commerce, May exports declined to 196,120 tons from 208,640 tons in April. This decline of 6 per cent brings exports below the two-year low point of 197,426 tons reached in February. Imports also were lower, but the change was inconsequental.

In view of tariff agitation, it will be interesting to watch the curve of iron and steel foreign trade during th next year. Exports now are at approximately the volume which prevailed through 1925, 1926 and 1927. Imports are decidedly lower.

Index of Foundry Equipment Orders Declines in May

In May the index of gross orders for foundry equipment compiled by the Foundry Equipment Manufacturers' association fell to 92.7. This is the first time the index has fallen below 100 since July, 1928. The decline from 122.8 in April is 24 per cent. The association's indices of shipments and unfilled orders also dipped sharply.

It would be unwise to view this continued decline for three consecutive months too pessimistically. The curve of foundry equipment orders fluctuates violently, even in times of good business. Each time the index has fallen below 100, rather rapid recovery has followed immediately or within a few months.



	1929	1930
Jan.	180.5	160.1
Feb.	197.0	196.4
Mar.	209.4	164.1
Apr.	172.5	122.8
May	177.7	92.7

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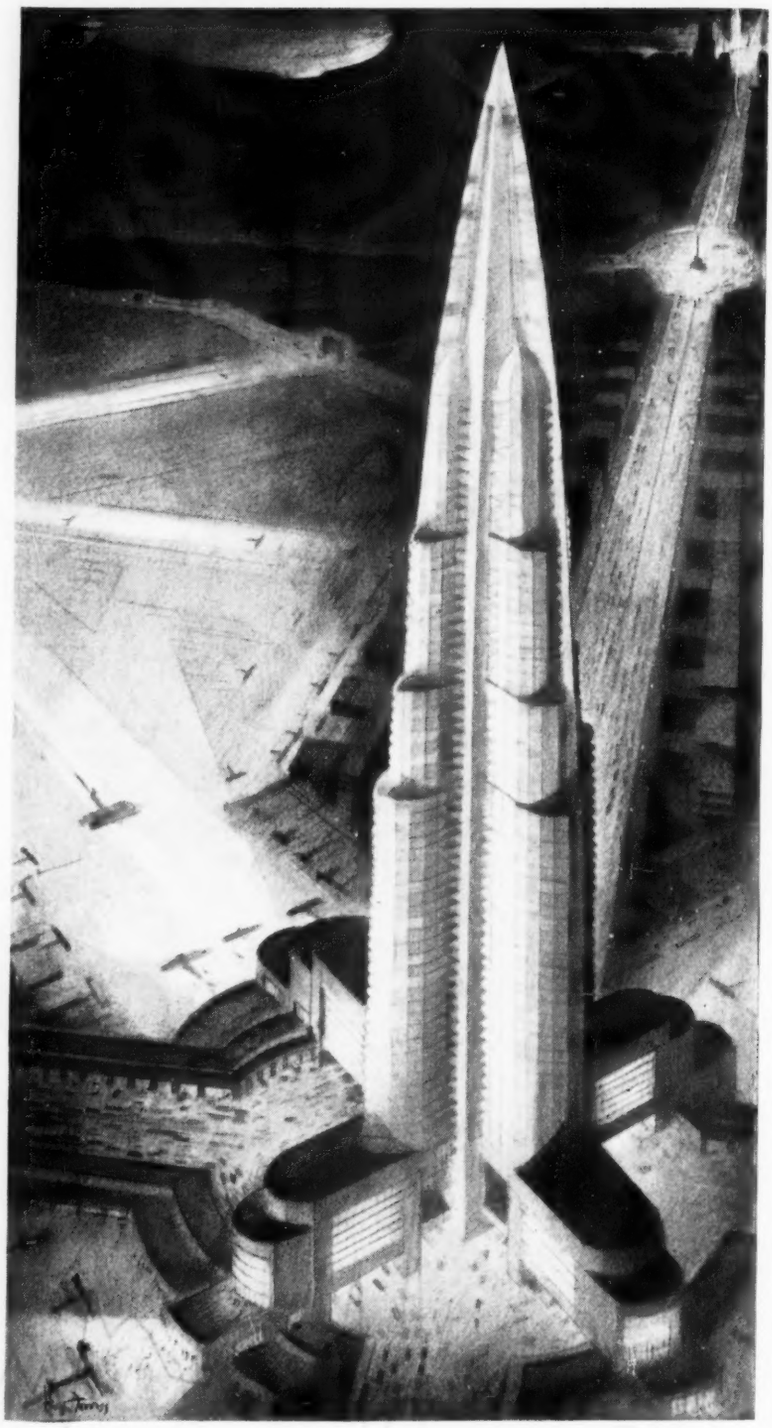

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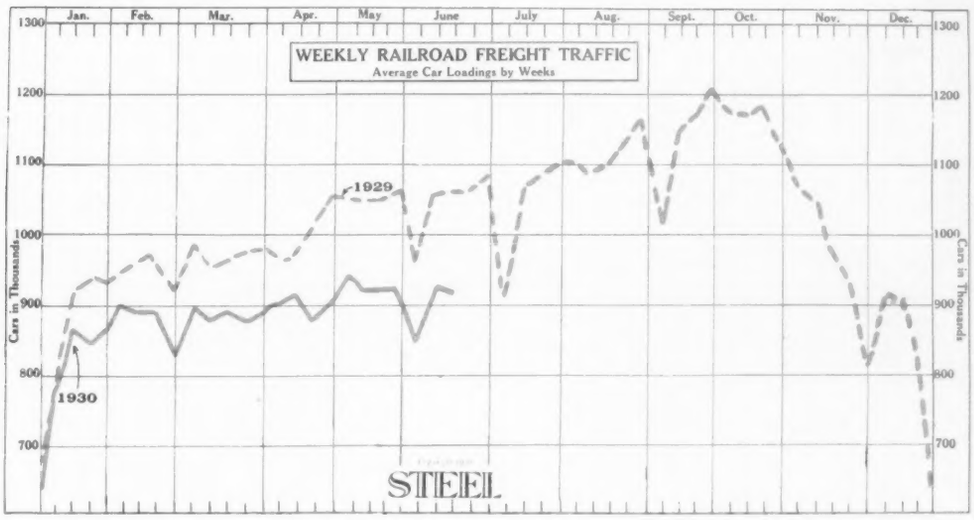


1930	
June 14	927,754
June 7	935,647
May 31	860,249
1929	
June 14	1,071,245
June 7	1,055,768
May 31	972,825

Weekly Car Loadings Continue Far Below 1929 Volume

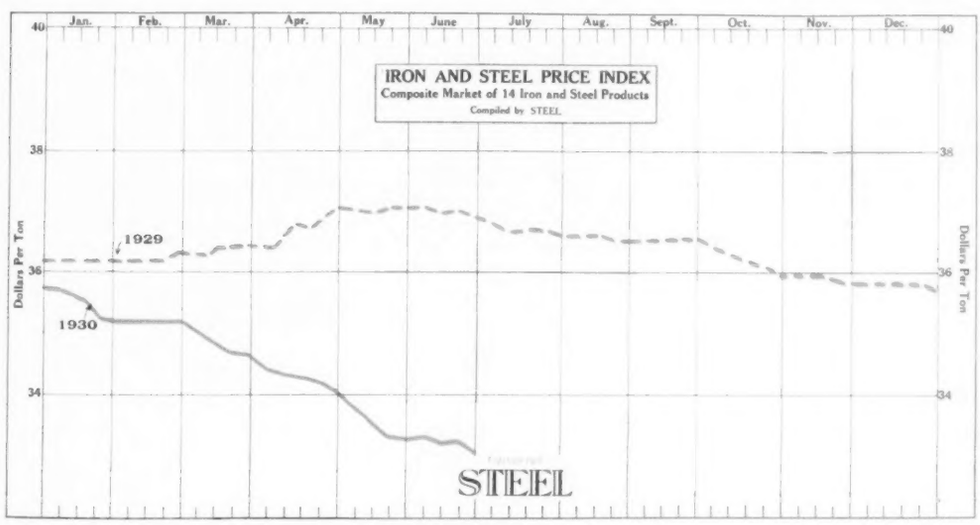
Weekly freight car loadings continue to range below those of the corresponding weeks of 1928 and 1929. The figures of the car service division of the American Railway association for the week ending June 14 stood at 927,754, as compared with 935,647 at the end of the previous week.

The recovery in June, 1930, from the dip caused by Memorial day has not been as positive as in the two preceding years. If the trend of the past is to be repeated this year, car loadings in the last weeks of June should go to a point higher or as high as any yet recorded this year.

Steel's Weekly Composite of Prices Dips To Below $33.50

Steel and iron prices, as measured by STEEL'S weekly composite of 14 iron and steel products, resumed its downward trend during the week of June 11 after a slight rise to $33.64 from the previous week's level of $33.56. After hesitating for two weeks at $33.52 the composite price had slumped to $33.44 by the week ending June 25. The composite registers a decline of 10 per cent from the corresponding week of 1929.

While statistical evidence does not yet show signs of a turning point in prices, the conviction is growing in steel circles that quotations are nearing bottom.



Monthly Averages

June, 1930	$33.53
May, 1930	33.73
April, 1930	34.44
June, 1929	36.99

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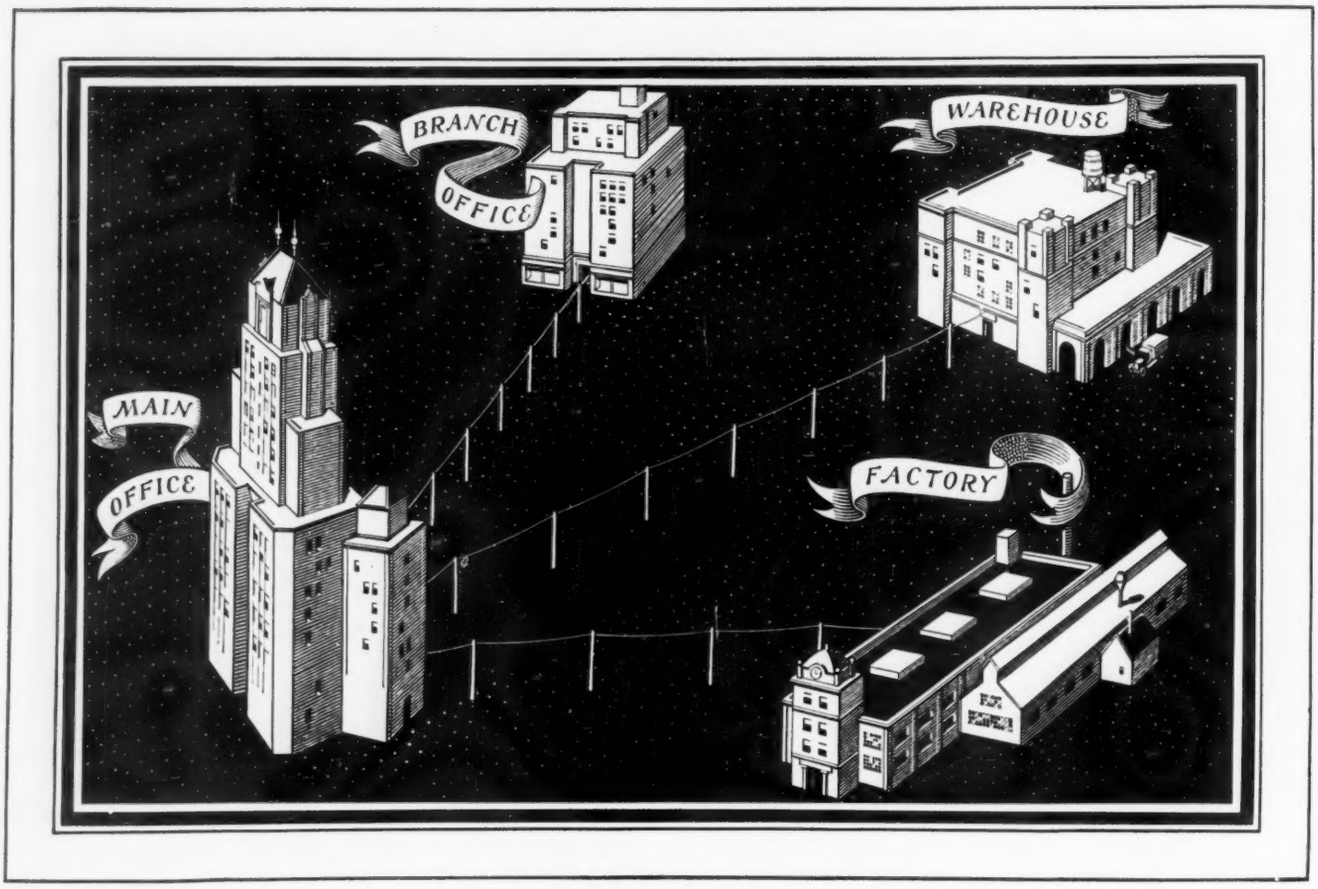

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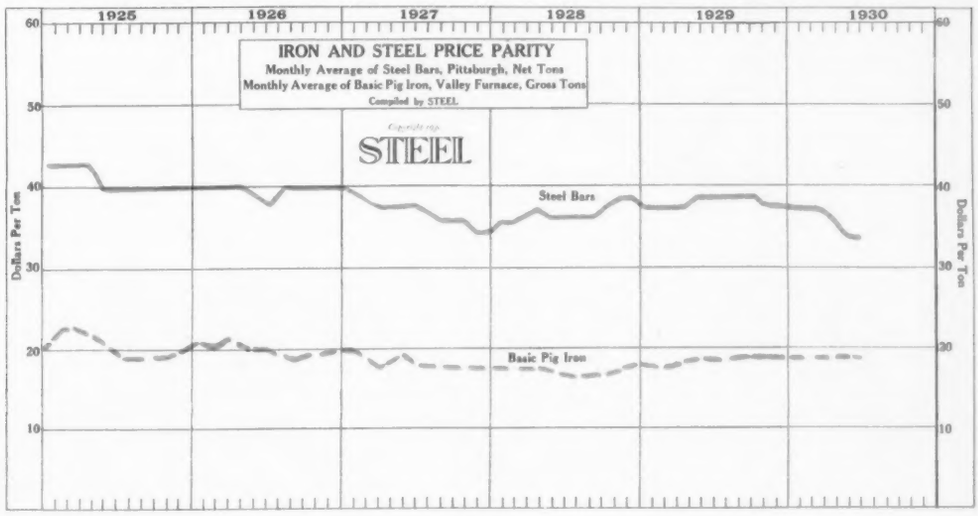
A blanket manufacturing concern uses it to give its customers speedier service. Orders are shipped from its Rhode Island mill the same day they are received at the New York office. Cancellations or changes are transmitted without delay. Office routine is simplified, orders being handled only once where formerly they were handled three or four times.

Telephone Typewriter Service is of value to small firms as well as large. Expensive duplication in operating details is eliminated, production curves smoothed out, deliveries speeded. Your local Bell Telephone Business Office will gladly make a survey of your communication needs and show you where this service will reduce costs.



Monthly Averages

	Steel Bars	Basic Iron
June, 1930	$35.00	$18.50
May, 1930	35.25	18.50
June, 1929	39.00	18.50

Spread Between Steel and Basic Iron Quotations Diminishes

Quotations of soft steel bars continue their downward trend while prices for basic pig iron continue to stay at the same level. Bar prices, as indicated by monthly averages compiled by STEEL, have been falling gradually since the midyear of 1929. From $35.30 per ton in May quotations have declined to $35 per ton, a level which has not been reached since October, 1927. Prices for pig iron, however, remain at $18.50 per ton approximately where they have been for the last year.

The spread between the prices of these two representative commodities is somewhat narrower than it has been for several years.

Daily Average Coke Production Is Holding Its Own

While the total production of coke in May dropped slightly below the output of April, by-product fuel registered a small gain and beehive a loss. The daily production went lower than in April, and in the case of beehive, the daily rate was the lowest in the statistical history of the industry.

A glance at the chart shows the broadening gap between the output of the two fuels. This diverging trend started in 1919, when by-product output exceeded that of beehive for the first time. Total production of coke in May was only 8.5 per cent below the corresponding volume for 1929.

By-Product Coke

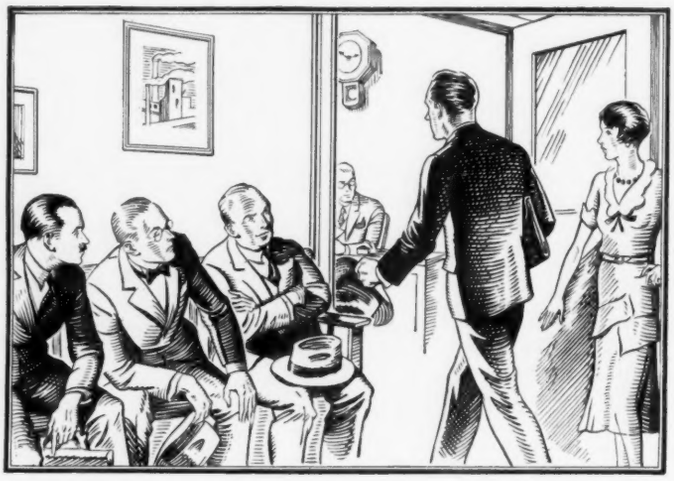
May, 1930	4,265,528
April, 1930	4,246,436
May, 1926	4,664,242

Beehive Coke

May, 1930	241,100
April, 1930	301,700
May, 1929	597,400

Here are the Crucial Minutes

. . . *which the business paper helps to save*



"Mr. Smith," calls the secretary. The first of a line of waiting salesmen, hurriedly collecting hat and sample case, enters the buyer's office. A ground-glass door closes behind him. The other men shift, recross their legs and settle down to wait their turn. It won't be long now.

And it won't! For the average time given to salesmen is brief—heart-breakingly brief, sometimes. In retail stores it varies between 4 minutes in department stores and 21 minutes in furniture stores, with an average for all lines of 12 minutes per interview. In industrial concerns it is scarcely longer.

Yet within those few minutes every actual sale must be consummated. Here, within the walls of one room, across one desk, and in the space of a few hundred seconds are focused the entire efforts of management, production, advertising—to stand or fall on the result of personal salesmanship. Here are the crucial minutes when a man must *sell*.

And because these selling minutes are so few, so precious, it is important to save them for actual selling, to free the hands of salesmen for the important work which can only be done face to face with the buyer.

It is here that the business paper is of untold value to the manufacturer. For it reaches *in advance* the man behind the ground-glass door. In its pages can be said beforehand everything that must be said as a preliminary to effective personal selling; to get introductions and explanations out of the way; to create friendships and reputations; to clear the decks for two-fisted selling.

Because the business paper of today deals so authoritatively and constructively with the problems of its industry, profession or trade, it not only passes through the ground-glass door, but it is read, thoroughly and attentively, by the man who constitutes the manufacturer's most important single objective. His interest makes the business paper the key to saving crucial selling minutes.

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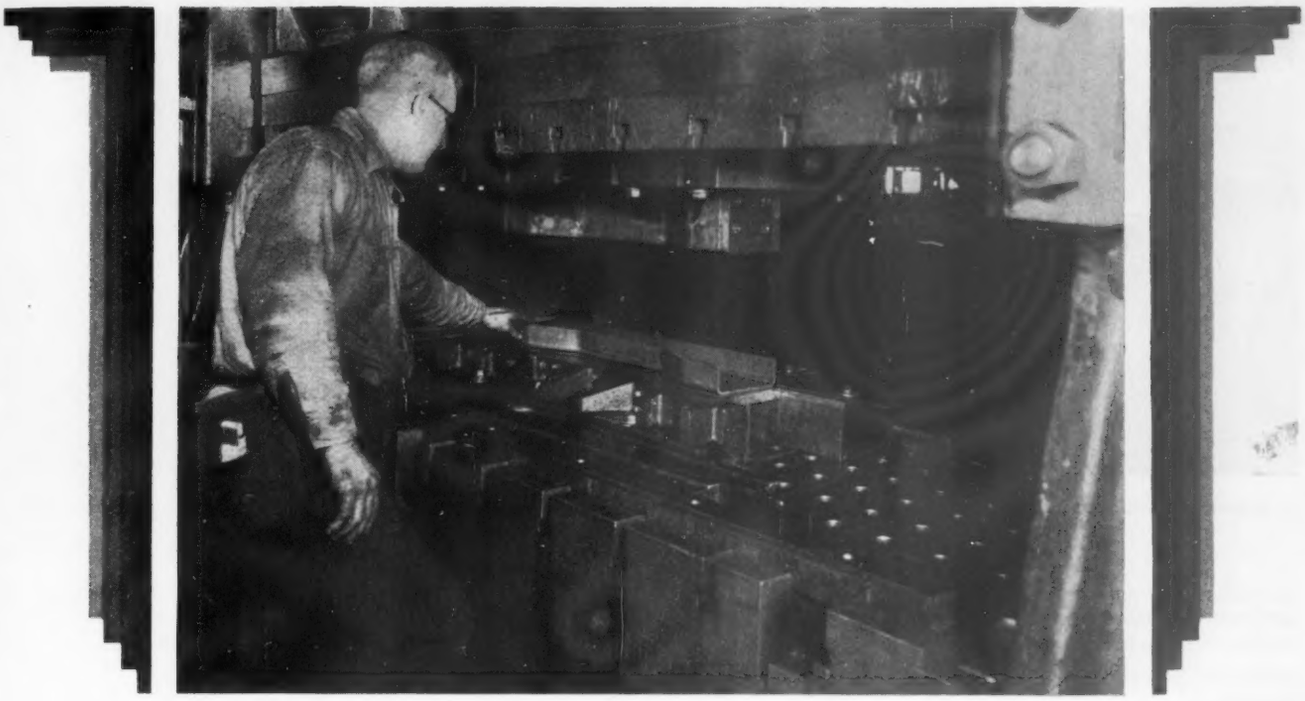


Accurate and elaborate dies are required for forming cross members and other frame parts on a production basis

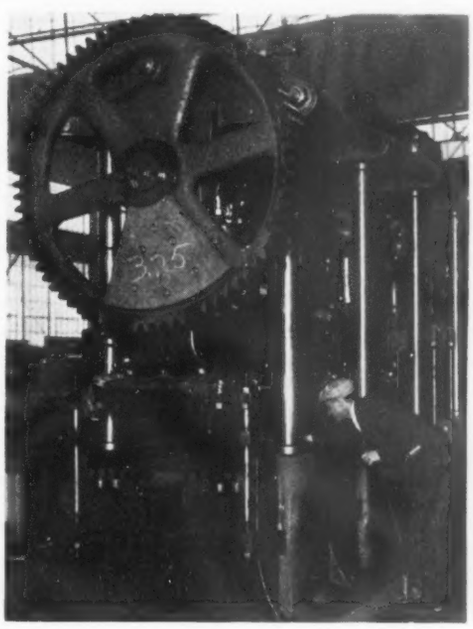
Heat Treats Alloy Steel Side Frames

BY H. R. SIMONDS

Associate Editor, STEEL

THE side frame for a modern heavy truck or bus is a specially-shaped channel formed from a long irregular steel plate in one press operation. Higher speeds, heavier loads and longer life are aims sought in motor vehicle construction and in their attainment naturally has come a wider use of alloy steels and heat treatment of many parts to obtain increased physical properties. These side frame channels frequently are from 30 to 40 feet long and it is not many years since thought of heat treating them would have seemed impractical. Today, frames are heat treated on a daily production basis.

As engines, transmission equipment and bodies are improved year after year, changes in their construction are followed with widespread interest, but comparatively few realize the progress being made in the development of lighter, stronger and less expensive side frames. Recently some unusual processes have been developed in the production of these alloy steel parts in the plant of the Parish Pressed Steel Co., Reading Pa. The plant at present turns out many products other than side frames but in point of tonnage frames constitute the principal product and the company claims to enjoy fully 80 per cent of the heavy-duty business in this country.



Heavy presses are used in blanking and forming parts for truck frame

Realizing the importance of keeping handling costs low, the company engineers have laid out the plant to give a minimum of travel for the parts in process. In general terms the raw material is received in cars on a siding which enters the plant at one corner of the building, and from there travels successively from one operation to the next down the length of one side of the plant and back on the other side to a point opposite the receiving track where the completed parts are placed directly into freight cars.

Such a system for flow of material through the production processes, when stated briefly, sounds exceedingly simple, but in reality the

Exhaust gases from this heat treating furnace are passed through a waste heat boiler providing steam for the pickling department

diversity of products and the many different processes requiring special equipment make it almost impossible to eliminate all back travel. For instance, many pieces are annealed after different drawing operations and it is obvious that single annealing ovens located in the process line would be impractical.

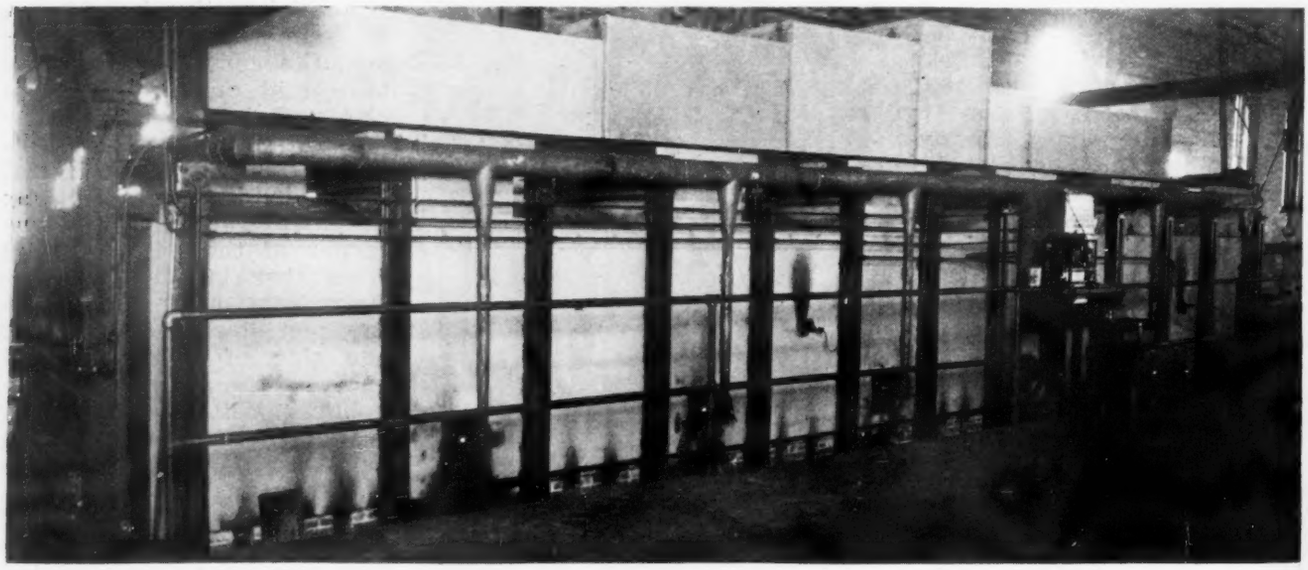
In carrying out pickling treatments, small parts are placed in alloy metal trays for immersion in the pickling and washing tanks and steel plates which are to be pickled are placed on edge on wooden platforms which are then picked up and lowered into the tanks. Depending on the size, six or eight or more plates are dipped at a time. Special metal spacers are hooked over the tops of the plates to keep them apart during dipping. The pickle bath uses a sulphuric acid base with an inhibitor and the sequence through the pickling operation is as follows: Pickle bath, hot water bath, cold water wash and finally an oil wash. The oil wash consists of a solution of 40 per cent soluble oil and 60 per cent water, and is used partly for protection against corrosion and partly to assist the action of the dies during deep drawing. The entire process takes about an hour for the average run of work.

An interesting economy is to be found in the heating of the hot baths, accomplished with steam made by passing exhaust gases from the various metallurgical furnaces in the manufacturing department through a waste heat boiler.

Heavy presses are located beyond

Analyses and Properties of Steels Used

	Carbon, per cent	Manganese, per cent	Phosphorus, per cent	Sulphur, per cent	Chromium, per cent	Nickel, per cent	Elastic limit, pounds per square inch	Ultimate strength, pounds per square inch	Elongation, per cent
Chrome-nickel steel	0.23	0.46	0.018	0.027	0.050	1.48	92,160	104,020	19.6
Manganese steel	0.30	1.52	0.023	0.021	.....	.....	90,200	103,700	26.6
Carbon steel	0.28	0.45	0.015	0.028	.....	.....	65,610	87,410	23.4



Long furnace used for hardening 40-foot frames, material being charged at the left end and withdrawn for quenching at the right

Arrangement of oil quenching chrome-nickel steel frames 40 feet in length

the annealing oven so that heavy plates to be formed pass in a straight line through the annealing oven to the presses, and then on to the hardening department. Smaller parts travel from the steel storage down rows of smaller presses. When annealing is necessary in connection with these smaller parts, they are shunted laterally out of the process line to the annealing furnaces and then back again into the main production line.

Side Frames Are Hardened

Heat treating long side frames is accomplished in a 40-foot furnace with doors at both ends and roller conveyors also at both ends so that work may be charged at one end and removed at the other. Other heat treating equipment includes quench tanks, handling apparatus and a car-type drawing furnace. An accompanying illustration shows the method of quenching a long side frame. The piece has been withdrawn from the furnace in the background and carried along the roller conveyor to a point opposite the quench tank. The illustration shows it being picked up by the overhead pneumatic hoist preparatory to quenching. The quench tank is just beyond the conveyor and the operators are shown in the act of pushing the frames off the conveyor and in position over the tank. Rapid and even quenching is accomplished by movement of the work up and down in the tank.

A typical bar for a heavy truck side frame is 360 inches long and is formed from a steel plate 5/16-inch thick and 30 inches wide. The steel has the following analysis: Carbon, 0.23 per cent; manganese, 0.46; phosphorus, 0.018; sulphur, 0.027; chromium, 0.50; and nickel 1.48. Average physical properties of this steel are: Elastic limit, 92,160 pounds per square inch; ultimate strength, 104,020 pounds per square inch; and elongation, 19.6 per cent. The plates are annealed in a 40-foot oil-fired car-type furnace equipped with automatic pyrometer control. In this furnace the pieces are brought up gradually over a period of 18 hours to a temperature of 1550 degrees Fahr. and then are held at that temperature for 8 hours more. Afterward they are cooled down in the furnace to 600 degrees Fahr. and then taken out and cooled in the air to room temperature.

After fabricating, which consists of blanking, forming, punching and trimming, the bars are brought up to 1550 degrees Fahr. in the heat treating furnace and quenched in oil as described. The oil is circulated constantly through a cooling system and is held at a maximum temperature of 140 degrees Fahr. The draw temperature which follows ranges from 900 degrees Fahr. to 1100 degrees Fahr., depending upon the carbon and chromium content of the steel. The analysis is watched carefully and the temperature is changed to compensate for variations. After drawing the pieces are cooled in air. The operations which follow heat treatment consist of sandblasting, straightening, drilling, assembling, painting and shipping. Frequent tests and inspections have been omitted from this description. In the process all heat treated parts are subjected to a brinell test.

Bars Are Straightened

A battery of 16 special machines is used in the difficult process of straightening the bars after heat treatment and sandblasting. Even with the use of ingenious machines, the work requires the utmost skill if it is to be done quickly and accurately. Following the straightening operation assembling the complete frame is done on an overhead trolley system which carries the various units past successive assembling stations. For the most part joining is by cold riveting with pneumatic bulldozers.

The company has found it possible to standardize on three typical steels, one a chrome-nickel steel, another a manganese steel and the third a carbon steel. The analyses of these three steels are shown in the accompanying table. Practically all alloy steel parts are heat treated and the proportion of work which is heat treated is growing constantly.

Heavy-duty hydraulic press fitted with irregular shaped dies for special forming work

Plate-Type Residence Floors Offer Market for Steel

By Lee H. Miller

Chief Engineer, American Institute of Steel Construction

TODAY the largest potential market for the steel industry exists almost untouched in approximately 800,000 residences that are each year built in United States. For 20 years men of vision have contemplated this potential harvest and have struggled to garner it. They have been inspired by the success with which steel has displaced other materials in ships, railway cars, automobiles and many other fields, but in their individual effort to reach the residential construction field, they meet range after range of barriers.

The United States department of commerce records show that in 1929 the structural steel used in the United States was approximately 3,850,000 tons, but the 800,000 residences offer a possible outlet for more than 5,000,000 tons of steel per annum. We should be able to more than double our market.

Next to clothes the housing problem of the race is the oldest and most universal. Since house construction has been an evolution of the ages, it is naturally enmeshed in an almost hopeless maze of traditions and prejudices. The construction of ships, railway cars and automobiles has been so completely subjected to engineering principles that the superior merits of steel are recognized and accepted with the result that it is the universal basis for such construction.

Needs Architectural Care

Except for large multiple housing units and expensive single units, the architectural profession has lost contact with house construction, and the industry has passed into the hands of speculative builders or small contractors whose principal interests are low first costs and an opportunity to quickly transfer the ownership to others. Without architectural supervision the opportunities for lowering standards is limited only by building code regulations that lack competent inspection.

With the most perfect construction material that man has ever known, the steel industry holds the solution to a condition that may be properly described as a national calamity. One hundred per cent honest construction could have a first cost double the first cost of average current practice, and still be 6 per cent cheaper than current first costs. This may indicate why it is easier to finance the purchase of an automobile than it is a supposedly permanent home investment.

Steel construction details can be standardized on a universal basis sufficiently comprehensive to enable the financier to know that it is largely free from the debased existing methods which show 53 per cent waste. He will be more willing to lend 80 per cent on a house whose value is 100 per cent of its cost than he will to lend 50 per cent on one whose value is only 47 per cent of its cost. Once a distinction is made in financing, the ultimate cost to the owner is less and the greater ease of financing makes a small increase in the initial cost less burdensome than the existing methods. On the other hand, so long as the financiers apply the same rule-of-thumb to value that they do to initial cost, the latter will be the controlling factor in construction.

What has been said regarding financing, makes it necessary to consider carefully the construction features, such efforts as have already been made to use steel in houses, have been confined almost entirely to the frame, and too often on the basis of using steel to imitate wood frames. Any proper approach to the house construction problem should embrace the careful study of every feature of a house and their relative importance.

WERE the 800,000 residences built in the United States annually to use steel floors, a total of 5,000,000 tons of plates would be required and this would open up perhaps the greatest market the steel industry has ever seen. In the accompanying article, taken from a paper presented at the spring meeting of the American Iron and Steel institute in May, the possibilities in developing this new application of steel are set forth. The author, Lee H. Miller, is chief engineer, American Institute of Steel Construction, Inc., Cleveland.

The basic and only reason for any building is to provide a floor which can be protected from the weather. The floor may be the ground itself, but it is usually a more intimate part of the structure. It must be properly supported and protected from the weather by roof and walls, which have openings for doors and windows. These features, together with stairs, constitute the essential parts of a building, but modern developments require provisions for such utility equipment as heating, plumbing, electric wiring, partitions, finishing, ornamentation, architectural treatment, etc.

Must Engineer the Use

Any floor construction that would meet the numerous requirements of occupancy would make the material, of which it is constructed, easy to promote for such other features as interior framing, partitions and roofs. To attempt to substitute steel for wood by imitating wood methods, is both illogical and expensive and success depends on using it along engineering principles that apply to its physical properties just as was done on ships, railway cars and automobiles.

For many centuries the world has looked for a satisfactory floor and developments of the steel age which started about 1880 should enable the steel industry to provide such a floor. The most severe service any floor receives is the ore carrying ships or the charging floors of open-hearth furnaces, and the most palatial environment a floor has is no doubt found on the fine ocean liners. In such cases only steel can meet the requirements.

Steel plates $\frac{5}{8}$-inch thick are used without stiffeners for the horizontal bottom plates of bins up to 18-foot square in connection with steel mill construction, and such floors carry live loads as great as 3000 pounds per square foot. This type of floor is, however, too flexible for ordinary occupancy and would require stiffeners to eliminate flexibility. Steel plates 24 inches wide and 3/16-inch or $\frac{1}{4}$-inch thick can be supported at their edges on parallel beams 3 inches, 4 inches or more in depth, and by automatic welders the plates and beams can be united to give a floor of great strength free from flexibility.

This floor can be fireproofed on the ceiling side to resist the complete destruction of the contents by fire without losing its strength. It can be given top surface treatment to meet any occupancy requirement, and all for a first cost that justifies its universal use. It will be free from shrinkage, warping and other annoying features. Covered with cork tile and laid in a mosaic pattern, it eliminates the necessity of carpets except as orna-

(*Concluded on Page* 66)

A Timken Bearing *at* Every Vital Point In Steel Mill Machinery

Fortunate is the steel manufacturer whose production engineers know the value of, and insist upon a Timken Bearing at every vital point of the machinery they buy—in rolling mills, electric motors, speed reducers, transfer and run-out tables, cranes and other equipment, for he is assured of continuous service, increased tonnage, substantial power and lubricant savings, low maintenance costs and longer machine life.

Fortunate is the engineer who is free to exercise his preference for Timken Bearing Equipped machinery, for he is in position to save money and time for his company, trouble and worry for himself.

Fortunate is the production manager who has such equipment at his disposal, for he can work to faster production schedules, reduce production costs and meet delivery promises.

Fortunate are the stockholders in steel companies using machinery with Timken Bearings at every vital point, for such equipment has an important influence on dividends.

It is not a matter of anti-friction qualities alone. It is a matter of the extra endurance, precision and rigidity made possible *only* by the exclusive combination of Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken-made steel. These qualities are obtainable only in Timken Tapered Roller Bearings. *Are you paying for Timken Bearings without getting them?*

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN *Tapered Roller* **BEARINGS**

Power Driven Rolls Speed Tank Car Production

FACED with the necessity of speeding up production to fill an order for 1000 railroad tank cars, the Pressed Steel Car Co., McKees Rocks, Pa., found previous methods of rotating the tanks during fabrication too slow. To overcome this difficulty, the company installed three sets of power-driven rolls on which the tanks could be turned easily to facilitate bolting and riveting. The tanks to be handled were 8 feet in diameter, 36 feet long and weighed 10 tons, but the rolls were built to accommodate various other sizes.

How Tanks Are Fabricated

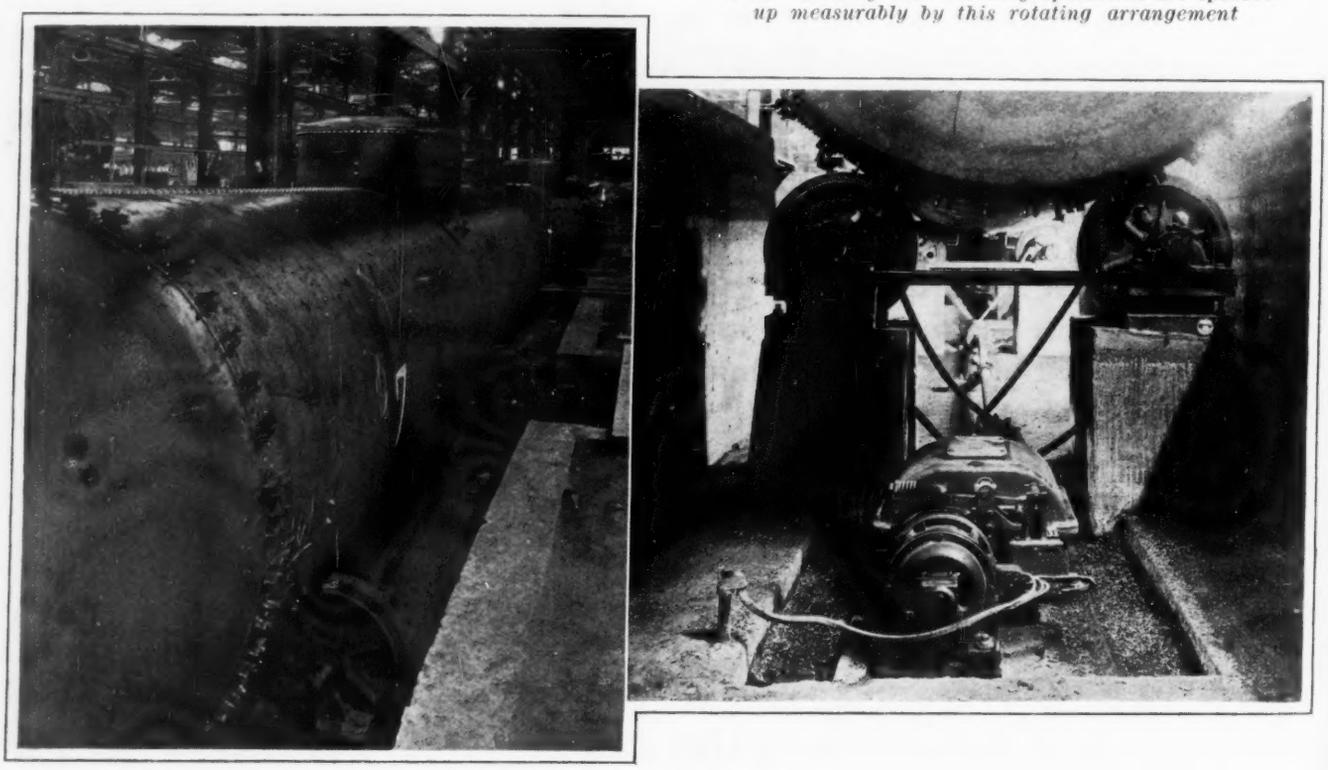
On the first set of rolls the tanks are key-bolted along the longitudinal seams, the ends key-bolted in place, and the holes in the longitudinal seams reamed, the reamer being located in a cage overhead. The longitudinal seams then are riveted, and the tanks transferred to the second set of rolls where they are reamed and riveted on the circular seams. On the third set, the domes are riveted on and other fittings added.

In the construction of the rolls, it was found that solid steel rollers were not suitable as the conical rivet heads were ¾-inch high, and the rollers would not climb over them. This condition was aggravated when rotating the tank to raise the dome which weighed about 800 pounds. Therefore it was found necessary to use rubber-tired rollers into which the rivets would imbed themselves and permit the tank to turn uniformly. The rollers as finally adopted are cast steel of 23 inches diameter and 4 inches wide, on which are pressed 4-inch wide solid rubber tires of the industrial type. The rollers are located 20 feet apart.

The countershaft in the bottom of the pit transmits power, received from a 2½-horsepower motor through a speed reducer and flexible couplings, to the four roller shafts which are driven at a speed of three revolutions per minute by means of a chain drive. A reversible controller permits turning the tank in either direction, while the slow turning speed, 20 feet per minute, enables the operator to turn a tank a few inches at a time. The motor is equipped with a solenoid brake. On the circular seams three of the holes are reamed from one position, then the tank is turned for the reaming of the next three. The bearings on the roller shafts are blocked up, and can be raised or lowered to adjust the roller to the various sizes of tanks.

The rolls, herringbone speed reducer and chain drive were furnished by the Link-Belt Co., Chicago.

TANK cars in process of construction are mounted on power-driven rubber-tired rollers as shown in the illustration, lower left. Below is the pit in which the rollers and drive mechanism are located. Bolting and riveting operations are speeded up measurably by this rotating arrangement

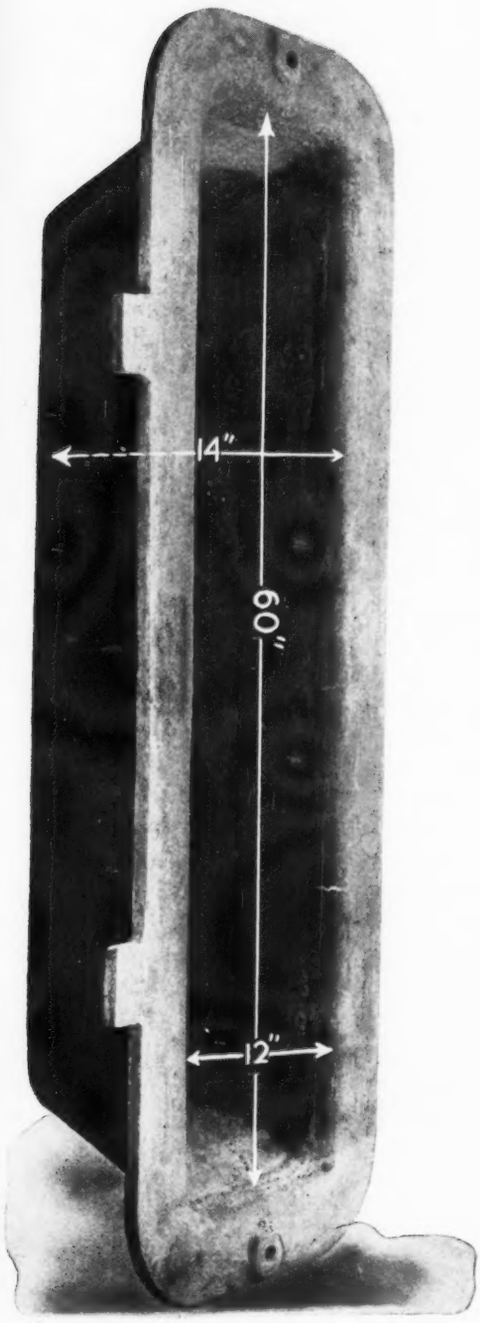


Campbell Memorial Lecture Subject Is Announced

"Oxygen in Steel," has been selected as the subject for the 1930 Campbell Memorial lecture which will be delivered by Dr. Marcus A. Grossmann, Republic Steel Corp., Canton, O., at the annual meeting of the American Society for Steel Treating, Stevens hotel, Chicago, Sept. 22-26. In addition to presenting the lecture on Sept. 24, Dr. Grossmann will also appear as co-author, with Dr. V. N. Krivobok, Carnegie Institute of Technology, Pittsburgh, of a paper on "Influence of Nickel and Carbon on the Constitutional Diagrams of 18 Per Cent Chromium-Iron Alloys."

Dr. Grossmann is well known in fields of research metallurgy, and has presented a number of technical papers before meetings of the society. He is chief metallurgical engineer, Republic Steel Corp., Canton, O.

Principal constituents of duralumin are iron, silicon, copper, magnesium and a small amount of manganese.



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Wire Rope Requires Attention and Careful Lubrication

By Fred Grove-Palmer

WIRE ropes, although constantly adding to their already long list of applications in industry, are one of the most ill treated of the servants of production. They must not be left to care for themselves for to operate efficiently and give long life they require attention and care. They are expensive, yet indispensable and demand consideration which this classification inspires.

It is a difficult matter to predict the life of a new wire rope. It is easy to give figures telling exactly how long the previous ones have been in use in the same position, but these figures do not necessarily imply that the ropes gave their full value. So many factors enter into the gradual destruction of these appliances and some of them if properly counteracted might allow the rope to go on more or less indefinitely. More wire ropes are scrapped because of lack of care than because of legitimate wear. The neglect may be unintentional and the adverse circumstances under which the rope is working may not appear to be bad, but the cumulative effect of these may easily have an effect quite out of all proportion to their apparent importance.

Must Fight Corrosion

Most important of all precautions that should be taken is the protection against corrosion. This depreciation may result from acidity in the air from alterations of damp and dry atmosphere, from air-borne spray blown from the nearby seashore or from many other causes. Closely allied to protection against corrosion is the matter of lubrication. It is possible to use a lubricant that will aid rather than counteract corrosion and, conversely, a well lubricated rope is a well protected rope.

The truth of these statements is obvious, yet the actual problem of combating corrosion is a big one. Too often the lubrication of wire rope consists of smearing on an occasional brushful of boiled flaxseed oil at such times as somebody or other happens to think of it. Perhaps it will be done at the whim of a gang boss, or an apprentice who does not wish to throw out the oil, and done just before some superintendent recalls that wire ropes do need lubrication and asks about them. These haphazard happenings can easily create the impression that the lubrication is well taken care of and so put off the establishment of a proper lubrication system.

Boiled oil is a lubricant, for a while it is true, but it absorbs oxygen from the air and soon gets sticky; in that condition it gathers up dust and particles of grit and holds on to them. Thus it becomes a continuous abrading surface for every sheave it passes over. Later, the oil hardens and flakes off, leaving the worn rope unprotected.

Lubrication Should Begin Early

From the first time it is used a wire rope requires lubrication and protection, and it needs it regularly. The oil or fat used should be a lubricant all the time and fresh supplies should be available as and when they are required. It is not enough to lubricate intermittently; it should be the regular job of one of the staff to see to this work.

One way to lubricate ropes is to put a can of oil at the highest point of the traverse and allow the oil to seep down by means of a cotton wick which makes contact with the rope as it passes by. Jute and flax tow are used, but cotton seems to answer the purpose more satisfactorily because the oil will flow along it readily and thus flow on the rope. A big flow is not needed; a little running on all the time, gives far better results if an easy flowing oil is used. The oil which gets upon the rope will make its way to the bottom of the cable run where a sump may be placed for the purpose of collection. It will be found that the oil has brought down with it the greater part of the dust and dirt which accumulated down on the rope. In this way the rope is perpetually lubricated, protected and kept clean, for the oil is sufficiently liquid to work right into the body of the rope and thus coat every part.

Oil of a good grade should be employed, having a viscosity somewhere around 270 to 290 and, of course, free from acidity. If the containers are of such a size that they will hold enough oil to last for three weeks, it will be sufficient to have the oiler visit them once a fortnight for the purpose of refilling. If this man knows it is his job to fill the cans every second Saturday and that the boss will check up on his work the lubricating of the wire ropes may be looked upon as accomplished. It is best to install the containers in places where they can be serviced and inspected without much trouble.

A number of compositions are on the market, for servicing wire ropes that run in damp quarries and mines. Most of these compositions are well suited for the purpose and it is only a matter of trial to find the best. It should consist of a non-drying oil or grease that will not drop off for some time; it must be remembered that the rope is not always easily visible in some of these situations. Although there is not likely to be so much dust as in a dry location, there may be mud and there may be salt spray thus the oil should be capable of repelling both these adverse influences.

A mixture which has given good service in various parts of the world is a composition containing powdered plumbago mixed with heavy petroleum; it is extremely easy to make and has the merit of being inexpensive. The plan adopted was to melt petroleum jelly in a container over the fire and then to stir into it three-quarters of a pounds of powdered graphite to each gallon, rather less than that actually, but there is no call for mathematical accuracy. The stirring is kept up until the mass solidifies on cooling, but in places requiring larger amounts, it might be more economical to have a proper mixer for the work.

The application of this lubricating paste differs from that of the oil previously described. It cannot be used on any form of "tricolator" and the best method of applying it is to make the rope do the work itself during the course of the traverse. It is useless to smear on clots of the paste and to expect that it will distribute itself evenly over the surface. It will not; it will merely rub off against the first object it touches. It is a rather peculiar circumstance that this manner of lubricating wire ropeways has been greatly neglected.

Proper Equipment Lacking

Since no equipment has been developed for applying paste to cables, a simple appliance will be described. Make two conical funnels of a suitable size and each of two parts so that they can be bolted together after the rope is up. The narrow end of the funnel is just large enough to let the rope through without rubbing. It is necessary to affix these funnels at places where there is not apt to be any whip and jerk in the rope, otherwise they might get pulled loose. They are bolted in place with the bases toward but not touching each other; this is to allow refilling and poking the paste down from time to time. The rope runs through the mass of paste and the surplus is kept back by the narrowness of the opening through which it has to pass. The object

Skip hoist and belt conveyor gallery built by the Link-Belt Co., Chicago. C-H Control is used.

Hoist Control . . . .

the backbone of Hoist earnings

A HOIST may be perfect in design and construction but if the Motor Control fails to put it through its cycle day after day, month after month, it can't earn all it should . . . if any actual profit at all.

You cannot adapt any previous Control to a new installation . . . because every new hoist installation differs from all others in load, speed, slope, cycle or travel. And "trial and error" methods of designing Hoist Control are costly, wasteful, unnecessary and unsatisfactory.

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During the past 30 years, Cutler-Hammer Engineers have encountered probably every type of Hoist Control problem. They have solved these problems to the entire satisfaction of the hoist owner. They have accumulated a wealth of experience in so doing. They have won a reputation—second to none—as specialists in Electric Control apparatus.

You can bring your Hoist Control problems to them in full assurance that the Control they design will be efficient, profitable . . . will pay its way from the start. A letter will enlist their co-operation.

CUTLER-HAMMER, Inc.

Pioneer Manufacturers of Electric Control Apparatus

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C-H

The Control Equipment Good Electric Motors Deserve

A-247

in having the double cone is so that it will work equally well with the rope running in either direction; for a continuous rope working in one direction only, a single cone will suffice. It should have a cover to keep out the dust. It may be necessary to put in several of these fittings during a run. Here, again, a responsible man should be put in charge to see that the cones are kept full and are working properly. Past experience has proven that one cone on either side of a sheave works equally as well as a double cone on one side only.

Lubrication is not the only matter of importance in connection with wire cables that the operating staff should bear in mind. It is necessary to have a spare rope in the store room. With new ropes made by a reputable manufacturer there is admittedly little chance of a sudden breakage until after they have been used a considerable time, but for safety another should be kept on hand.

Details Are Helpful

When ordering a fresh rope it is a good plan to give full specifications. Some of the principal points that should be noted when ordering are as follows: Number of ropes required and length of each; diameter of ropes if under or over lap; diameter and description of winding drum; space between drum and sheave; load without the rope; make of rope now in position; quality of rope now in position; number of wires to a strand; hemp or wire in strands and heart; speed or run; condition of location; wet or dry.

Those details apply to ropes for winding and hoisting, but if it is to be used for haulage, the following additional or substituted information should be put on the order: Surface or underground working; number of angles and their degrees; size and diameter of sheaves; and gradients.

A not altogether unknown error can be made by measuring the diameter of the rope as a hexagon instead of as a circle. That is by taking the center from the flats of two opposite pairs of strands instead of outside edge of a strand on each side. This may make considerable difference, especially when ordering a sheave. A sheave which is too small causes the rope to ride, adding to the wear and tear and detracting from its efficiency.

Much often can be gained by taking the ropemaker into full confidence; his wide experience in many fields will give him advantages that the user of the rope may never get. Such information is always willingly imparted and may lead to better results without any extra expenditure. It is never profitable to cut down the original expense on ropes. It is far better to use the best and have the rope a size too large rather than too small. An allowance of from 15 to 20 per cent above the theoretical strength of the rope in use should be allowed; the rate of the run will indicate which figure to take. It is an economy to work a 10-ton load on a 12-ton cable.

Proper Replacement Needed

When a change is being made from a hemp to a wire rope, practice has shown that it is best to have the new rope equal in weight per foot run to the old one; this will not call for the replacement of sheaves because the new wire rope will equal the hemp in pliability. However, the wear on the ropes will be reduced if the diameter of both drum and sheaves is increased, and in all cases in which there are to be alterations in the plant, it will be well to consider the question of making these improvements wherever possible.

It may be taken as an axiom that the greater the speed the greater the wear on the rope. It is, therefore, more economical to increase the weight of the load rather than the rate of the run, if it is necessary to get more work out of a certain hoist.

The question of hemp or wire hearts to ropes has some importance. Hemp ropes are more pliable and run better over sheaves of small diameter, but wire has greater tensile strength which in some sizes is as much as 25 per cent. There is no advantage in using galvanized ropes, though these are sometimes recommended because they resist the action of the atmosphere. While this is true enough for ropes that are fixed, in moving traverses the friction against the sheaves soon rubs off the coating of zinc and the unprotected wire is then more susceptible to corrosion than wire which has never been coated; the acid treatment required by the galvanized process making it more easily rusted.

Friction on the rope may be reduced by lining the grooves of the sheaves with blocks of hardwood, with leather or with rubber. The grip is also improved, but all these additions call for frequent replacement and the economy effected in one direction may be overshot by the expense of upkeep. These linings have been found especially useful for high speed transmission of power between locations a considerable distance apart.

Steel Is Used Widely

Ordinary iron wire, except in some of the smaller ropes, has been entirely replaced by steel on account of its lightness and additional strength. Here, again, it will be found to be a paying proposition, when replacing an iron rope by a steel one, to have the new one of the same diameter as the old, because of the gain in strength and length of life.

Whenever feasible, the overlapping of the rope on the drum should be avoided as this causes much additional wear. In elevators and shafts the load should never exceed 10 per cent of the breaking strength of the rope, and every effort should be directed to the avoidance of sudden strains.

Hemp-cored ropes may not be used when part of the traverse lies through a very hot area because the fiber is apt to be burnt out thus reducing the strength. A rope with a wire heart is indicated for this use.

For the sake of friction on the rope, the pitch of the grooves on the sheaves should be of good shape and sufficiently large. Tightness and a too acute angle will add considerably to the wear. The more recent shape resembling a U-shaped Y appears to be answering well especially for elevators.

The cost of a wire rope is no small item and there is no doubt that great savings can be effected by reasonable care of them. The management should always try to impress upon workmen the urgency for treating wire ropes and cables properly. All this is equally well realized by the makers of the ropes, for a purchaser will always prefer to buy from the manufacturer whose product lasts longest.

Carnegie Institute Receives Sand Handling Unit

The sand handling and preparing equipment displayed at the Cleveland exhibition of the American Foundrymen's association by the National Engineering Co., Chicago, has been presented to Carnegie Institute of Technology, Pittsburgh, for use in the foundry courses at that institution.

This unit was a one-quarter size complete sand preparing and handling system consisting of a shakeout grate and hopper from which the sand was conveyed on a shakeout belt conveyor which was equipped with a magnetic head pulley at which point all magnetic refuse was removed. The sand was then elevated in a belt bucket elevator with automatic takeups of special design and discharged into a revolving hexagonal screen where the sand was screened and dropped into a storage bin. This storage bin was arranged with two discharge openings which were equipped with duplex gates. Under this bin were two batch measuring hoppers, each holding one batch of sand of the proper size for the small intensive sand mixer.

In the mixer the new sand was added and the batch tempered and blended, thus giving control of batch mixing before it was discharged on to the distributing belt. The sand, when properly prepared, was discharged on to an inclined distributing belt from which it was plowed off into hoppers equipped with gates for filling the flasks on molding machines.

"Here, Lad —

I've been following up the work of your friend 'Arc Welding' and I'm convinced that what he has done in other plants can be done for our profit, too . . I'll ride along."

"Fine, Pop —

But how far?

Arc welding isn't a hitch hike.

Deciding upon arc welding is only a short ride.

If arc-welded steel construction is adopted for economy of production, it will do its job just as a man will do a given job.

But one man is sometimes better than another depending upon his specialization and experience.

Just so with arc welders. That's why I ask you to look into the Lincoln 'Stable-Arc' . . . a pioneer machine and the sole specialty of a substantial organization.

But even that isn't riding the whole way.

After you've achieved economy of process (arc welding) . . . after you've achieved economy of machine ('Stable-Arc') . . . then you've got to plan for economy in design of details in a way similar to that shown on Lincoln Application Sheet No. 3, series 2 (sent gratis).

Then you can take your ride, and it won't be on the rumble seat."

The Lincoln "Stable-Arc" Welder

— welds easier
— makes better welds
— permits greater output

because of the steady uniform arc throughout entire welding range, which is the result of:

Variable voltage design
Laminated magnetic circuit
Separately-excited generator field
Double control of welding heat
All steel construction

No other welder has all these features.

The Lincoln Electric Co.,
Dept. No., 20-7 **Cleveland, O.**

"Stable-Arc" LINCOLN WELDER

W-149

Employs Salt Bath Annealing in Drawing Hollow Wire

AS DIFFICULT as the drawing of extremely small size steel tubing may appear, these operations are performed on a routine basis in the plant of the Ellwood-Ivins' Steel Tube Works, Philadelphia. In this company's establishment chrome-molybdenum tubular billets 2 and 3 inches in outside diameter and wall thickness of about 5/16-inch are transformed through many draws and many anneals into hollow wire 0.009-inch in outside diameter with a wall thickness of 0.001-inch or less. This chrome-molybdenum alloy is either S. A. E. 4130 or S. A. E. 4140 depending upon the quality of tubing desired. Tubing of high and low carbon also is produced.

Extremely fine tubing has many uses, one of which is for hypodermic needles. Ten or 15 years ago most of the hypodermic needles used in this country were imported, many being made of Swedish steel in Germany. Now, however, the American demand is supplied almost entirely by American manufacturers from domestic alloy steels.

Many Draws Are Required

At the Ellwood-Ivins' plant the reduction of tubular billets to the smallest sizes of steel tubing calls for some 60 to 75 cold passes. The draw bench, by means of which the tubing is drawn, has a set of dies at one end and a motor-driven chain traveling throughout its length. One end of the tube to be drawn is swaged to a reduced diameter so that it may be passed through the dies and gripped by tongs which in turn are fastened to the motor-driven sprocket chain. The inside diameter of the tube is controlled during the drawing operation by a mandrel slightly smaller in diameter than the tube to be drawn. For the small sizes and for special long tube lengths the mandrel is omitted. Experience has shown that no matter to what extent the cross section of the tubing is reduced, its opening persists. Each drawing operation reduces the diameter of the opening and the wall thickness of the tube and at the same time increases its length.

Requires Careful Drawing

As the diameter of the tube becomes smaller great care is required in the drawing process. The design of dies and quality of the tubing material must be proper or defects will appear, also a uniform anneal is imperative.

Drawing is aided by coating the tube just ahead of the die with a lubricant solution, and after each draw the tube is annealed, pickled and washed before being subjected to subsequent drawing. The annealing is done in a salt bath in a new type of furnace supplied by the Bellis Heat Treating Co., Branford, Conn. The furnace contains a pot 28 feet long, approximately 30 inches wide and 30 inches deep, filled with a bath of fused salt bearing the trade name Lavite. The pot is heated by electrodes immersed in the liquid, this design reducing to a minimum the heat losses due to radiation. The furnace handles 2000 pounds of tubing per hour in lengths ranging from 10 to 20 feet. The tubing is placed in perforated pans and immersed for periods ranging from 10 to 30 minutes depending upon the size of the tube and the quantities being annealed. The bath is held at 1400 degrees Fahr. before receiving the work and although the temperature drops to 1200 degrees when a full charge of tubes is immersed it quickly returns to 1400 degrees.

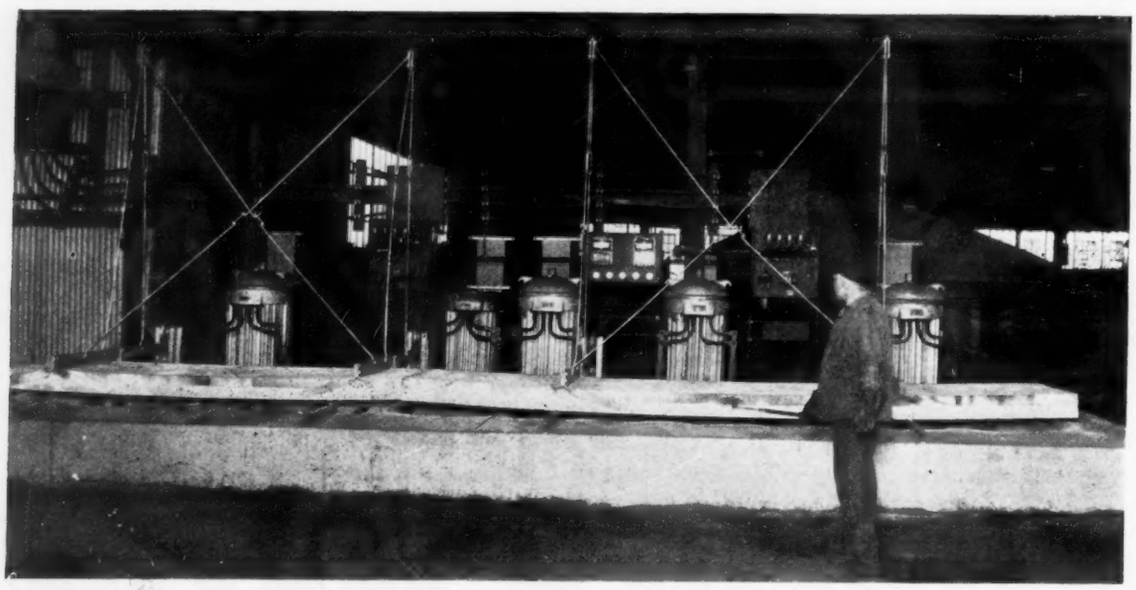
The tubes come out of the furnace clean and free from all oxides but they are covered with a slight film of salt, which is left on purposely until the tubes cool to give protection. When the tubes are cool they are washed in a large tank of pure water from which they are taken clean and semibright. They would be fully bright except that the lubricating compound which is composed of tallow and palm oil leaves a thin film which is carried into the furnace bath, and which turns into a fine carbon deposit by the heat. This deposit is claimed to be not at all injurious and may be removed by simply rinsing the tubes in a 5 per cent sulphuric acid solution.

Annealing Must Be Uniform

When the small sizes are reached in the drawing process uniform annealing becomes increasingly important and the salt bath is claimed to give the proper uniform results. Such bath solution as may be carried over into the wash tank is recovered by evaporation.

In describing a furnace similar to the one used at the Ellwood-Ivins plant Wesley B. Hall, Yale university, New Haven, Conn., stated that the

(*Concluded on Page* 66)



Salt bath for annealing small size tubing or hollow wire after each drawing operation. The bath is heated electrically, electrodes being immersed in the fused salt

Manganese Steel Strength Due to Sorbitic Structure

NEW standards for austenitic manganese steel castings and open-hearth iron plates of flange quality were proposed by committee A-1 on steel at the annual meeting of the American Society for Testing Materials in Atlantic City last week. According to the report of the committee by J. B. Young, Reading Co., Reading, Pa., chairman, tentative standards to be advanced to standard include those for steel tie plates, iron and steel chain, and methods of sampling rolled and forged steel products for check analysis. Several tentative revisions suggested apply to specifications for commercial quality hot-rolled bar steels; cold-finished bar steels and shafting; steel plates of structural quality; and steel plates of flange quality for forge welding.

Considerable amounts of steel containing 1.25 to 1.75 per cent manganese are being consumed as rail steel, high-strength structural steel, castings, forgings, etc., according to E. E. Thum, New York, who presented a paper dealing with new manganese alloy steels. Discussing this subject, Bradley Stoughton, Lehigh university, Bethlehem, Pa., stated that high manganese in the old bessemer rails was demand and not obtained by accident through recarburizing. He also advanced the theory that the reason for the high strength of medium manganese steels is due to the sorbitic rather than the pearlitic structure formed.

Consideration of Use Important

H. H. Morgan, Robert W. Hunt Co., Chicago, cautioned against the too hasty application of medium manganese steel for any or all purposes. He also mentioned the occurrence of occasional heats of that steel containing 0.67 to 0.70 per cent carbon and 1.55 to 1.60 per cent manganese in which martensite needles appeared after rolling into rails. These when subjected to unusual conditions of stress caused split rail heads.

Discussing a paper on the relative merits of some different alloy steels with respect to certain mechanical properties by Bradley Stoughton and W. E. Harvey, a paper which is abstracted briefly on page 73 of this issue of STEEL. A. B. Kinzel, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y., pointed out that merit value or quality factor must be related to service application, and not just obtained indiscriminately. Other objections he made to the figures used for physical properties and methods of tabulating data.

The effect of increasing the nickel content of the austenitic iron-chromium-nickel alloys in the 18 per cent chromium 8 per cent nickel composition was given in a paper by Norman B. Pilling, International Nickel Co., New York. From an investigation of cold-drawn bridge wire which was used in the Mt. Hope and Ambassador bridges, L. S. Moisseif, New York, reported consistent checks between the more exacting laboratory tests and the routine shop tests of physical properties.

Results of tests on spring steels, phosphor bronze and hard-drawn aluminum wire indicate that the elastic limit and proportional limit do not coincide, according to M. F. Sayre, Union college, Schenectady, N. Y., who presented a paper on that subject. Values for the rate of change of modulus of elasticity with stress intensity were recorded. A magnetic strain gage which can be used for accurately determining stress under dynamic conditions in such structures as rails, bridge members, shafts, etc., was described in a paper by J. P. Shamberger, Westinghouse Electric & Mfg. Co.

Committee E-4 on metallography, of which John A. Roebling's Sons Co., Trenton, N. J., is chairman submitted a proposed revision of recommended practice for thermal analysis of steel, and a revision of standard rules governing the preparation of micrographs of metals and alloys, including recommended practice for photography as applied to metallography.

Coal from the Kuznetsk district, Russia, furnishes a high-grade coke used in some of the Ural mountain blast furnaces.

Fatigue Tests on Metals Reveal Mechanism of Failures

A COMPREHENSIVE survey of the present knowledge of fatigue of metals as presented in the world's technical literature will be published shortly by the American Society for Testing Materials. This announcement was made at the annual meeting of the society in Atlantic City, N. J., last week by H. F. Moore, University of Illinois, Urbana, Ill., chairman of the research committee of fatigue of metals, who stated that industry would thereby be provided with a reliable guide.

In a paper on the effect of under stressing open-hearth iron and cast iron, J. B. Kommers, University of Wisconsin, Madison, Wis., stated that the more homogeneous open-hearth iron has its strength increased 10 per cent while the non-homogeneous cast iron increases about 31 per cent. Professor Moore suggested that this performance may account for the difficulty in cold working steel without cracking.

Fatigue Tests Made on Welds

A paper on fatigue tests of fillet welds by R. E. Peterson and C. H. Jennings, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., covered fatigue data on machining, spacing and size of the weld. Professor Moore inquired if values of 16,000 to 18,000 pounds per square inch nominal stress for 10,000,000 cycles would be a good criterion for the welds as compared with 26,000 to 28,000 pounds per square inch for the parent metal. It was admitted that while the strength of the welded metal undoubtedly is lower, more data are necessary to establish the true value.

As a result of fatigue tests on nitrided steel before and after hardening conducted by N. L. Mochel, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., it was revealed that the endurance limit before nitriding is placed at 76,000 pounds per square inch and after nitriding at 84,000 pounds per square inch.

Corrosion Rates Studied

Work done in connection with corrosion also was considered extensively. D. J. McAdam Jr., naval experiment station, Annapolis, Md., reported on the effect of stress and cycle frequency on the rate of damage of ordinary steels, corrosion-resistant steels, monel metal and aluminum alloys under corrosion. Committee A-5 on the corrosion of iron and steel reported additional failures of test sheets at Annapolis, Md., and results of total immersion tests at Annapolis, Pittsburgh and Washington. The committee also proposed the advancement to standard the tentative specifications for testing zinc coated iron and steel; wire and wire products; iron and steel telephone and telegraph wire; iron and steel tie wires; wire fencing; chain link fence fabric galvanized after weaving; barbed wire; and steel wire strand.

Phosphorus in Wrought Iron Raises Tensile Strength

RECOMMENDATIONS for numerous changes in standard and tentative specifications for wrought iron, cast iron and malleable iron were made at the annual meeting of the American Society for Testing Materials in Atlantic City, N. J., last week. Reporting for committee A-2 on wrought iron, H. W. Faus, New York Central Lines, New York, urged that revisions proposed in 1928 and 1929 in standard specifications for lap welded and seamless steel and lap welded iron boiler tubes; for welded wrought iron pipe; for staybolt, engine bolt and extra refined wrought iron bars; and for hollow rolled staybolt iron be submitted to letter ballot of the society.

The same procedure was recommended for new proposed revisions in those standards and those for refined wrought iron bars; wrought iron plates; wrought iron rolled or forged blooms and forgings for locomotives and cars; and for definition of terms relating to wrought iron specifications. The tentative specifications for iron and steel chain were recommended for adoption as standard.

Reporting on an investigation of phosphorus in wrought iron, J. H. Higgins, Camden Forge Co., Camden, N. J., stated that tensile strength and yield point are increased and that the elongation and reduction of area are decreased with an increase in the phosphorus content. Vibratory tests also show an increase in vibration before failure as the phosphorus increases which is at variance with general expectation and opinion and may necessitate additional tests for clarification.

Abandon Quality Terms?

Abandonment of the use of terms referring to quality of cast iron such as high test and recommendation to the effect that cast iron be designated according to the class of work such as pipe, wheels, etc., was proposed by H. Bornstein, Deere & Co., Moline, Ill., in reporting for committee A-3 on cast iron. The committee also recommended that the tentative specifications for chilled tread cast iron wheels be revised and continued as tentative, and that the requirements on high test cast iron be revised in that the minimum load be changed from 2250 to 2500 pounds in the transverse test and from 28,000 to 33,000 pounds per square inch in the tensile test.

In submitting for advancement from tentative standard to standard the specifications for gray iron castings for valves, flanges and pipe fittings, considerable discussion was stirred up. J. T. MacKenzie, American Cast Iron Pipe Co., Birmingham, Ala., disapproved the adoption, stating that the proposed bar for testing is not the standard of the society; that the phosphorus requirement of 0.75 per cent is too rigid for the lower grade iron of 21,000 pounds per square inch tensile and too high for the higher grade of 30,000 pounds tensile strength. It finally was decided to submit the specification to letter ballot.

Committee A-7 on malleable castings through its secretary Enrique Touceda, Malleable Iron Research association, Albany, N. Y., recommended that the yield point as designated in the present standard specification be changed from 30,000 pounds per square inch to 32,500 pounds per square inch.

Employs Salt Bath Annealing in Drawing Hollow Wire

(*Concluded from Page* 62)

salt bath has been designed for heat treating high-speed steel, but may be used successfully at lower temperatures for annealing. The salt bath may be compounded to melt at various temperatures and it is advisable according to Professor Hall to have the operating temperature only slightly above the melting point of the salt. When this is the case the salt freezes about the cold work as it is immersed and the frozen layer then melts off as the steel comes up to the desired temperature. In this way the frozen salt layer acts as a cushion against the high temperature.

The power required for the full heat treatment of steel in a typical immersed electrode type of salt bath furnace is given by Professor Hall as 0.36 kilowatt-hours per pound of steel. This, however, is based on a three-pot furnace operating at 2300 degrees Fahr. For the tube annealer described in this article the manufacturers estimated the power consumption at 140 to 200 kilowatt-hours per ton of tubing annealed. This figured less than 0.10 kilowatt-hours per pound of steel which is the power required during operation for supplying the heat losses of the pots and for heating during operation for supplying the work from room temperature to the full required annealing temperature. When the furnace is not operating the current, of course, may be turned off, in which case there is no power consumption. However, because of the fact that the frozen salt has a high resistance the usual procedure is to hold the bath molten over night at a temperature just above the melting point. The power required for this is low if a well designed cover is used. To heat from the holding temperature to the operating temperature requires about half an hour. To start from cold requires two or three hours if the heating is all done electrically. However, the heating from the cold state may be considerably accelerated by the use of a gas or oil torch directed into the furnace.

The unusually low power consumption for the long tube annealer has been secured by the use of pot walls and cover of high heat resistance and also by the use of an automatic control on the primary side of the transformers which cuts off the current at the predetermined annealing temperature. Thus no more heat is used than that actually required to heat the work and to offset radiation. In practice the temperature is found to be uniform throughout the bath and the results identical for work annealed at different times.

Plate-Type Residence Floors Offer Market for Steel

(*Concluded from Page* 54)

ments, and the cost complete is less than that of a good domestic carpet required to cover other types of floors.

For multiple story steel frame structures this floor reduces the dead load from 30 to 50 per cent or more, and permits of higher structures on the same frame and foundations. Its thickness reduces the height from floor to floor by several inches. The weight of the steel in such a floor would be from 10 pounds per square foot for light loads and relatively short spans to 15 pounds for heavier loads and longer spans. If the floor area of the average residence is 1500 square feet, it would require a minimum of 7½ tons of steel for each residence, or a total of 6,000,000 tons for the 800,000 homes built each year.

The adoption of the steel floor will greatly simplfy the rapid introduction of steel for other parts of the frame, roof and partitions, and would open the greatest market the steel industry has even known. It can be done and ultimately it will be done, but all the interested parts of the steel industry acting in co-operation are essential to its completion.

Members of the Pittsburgh chapter of the American Society for Steel Treating recently elected the following officers for 1930-31: Chairman, D. J. Richards, E. F. Houghton Co.; vice chairman, E. J. Dix Jr., Aluminum Co. of America; secretary, treasurer, H. L. Walker, Box 521, North Side, Pittsburgh.

Polishes Radiator Shells on Automatic Machine

CORROSION-RESISTANT steel, which the Ford Motor Co., introduced recently in exposed bright parts of its automobiles, is a distinct innovation in the motor industry. This material is used in the new Fords for radiator shells, cowl strips, headlamps, tail lamps and radiator, hub and gas-tank caps. The steel must of course be polished and buffed carefully and these operations performed at the Ford plant in finishing the radiator shells are of more than usual interest as the work is performed on unusually large automatic polishing machines, a partial view of one being shown in the accompanying illustration.

Under ordinary conditions a radiator shell does not lend itself readily to automatic polishing, but by the equipment of the special machine in question the problem has been overcome in a satisfactory manner. The value of automatic polishing in finishing radiator shells in the great quantities demanded by the production schedules is apparent. For a moment imagine the immense polishing department that would be necessary if some 10,000 to 12,000 radiator shells were polished and buffed daily, wholly by manual effort.

Fixtures Are Indexing Type

Referring to the accompanying illustration, it should be explained that the machine consists of two principal units, the overhead mechanism for rotating and traversing the polishing wheels and the conveyor on which are located fixtures for holding the work. As the illustration shows, these fixtures are of the indexing type and each section holds five radiator shells. Thus in the polishing operation a number of fixtures are passed under the wheels that polish one side. Then an operator indexes the shells to the next position where the tops are polished. An ingenious cam arrangement traverses the polishing wheels in an arc to correspond to the shape of the top of the shell at this stage of the polishing operation. After the tops are polished the fixtures again are indexed and the other side polished.

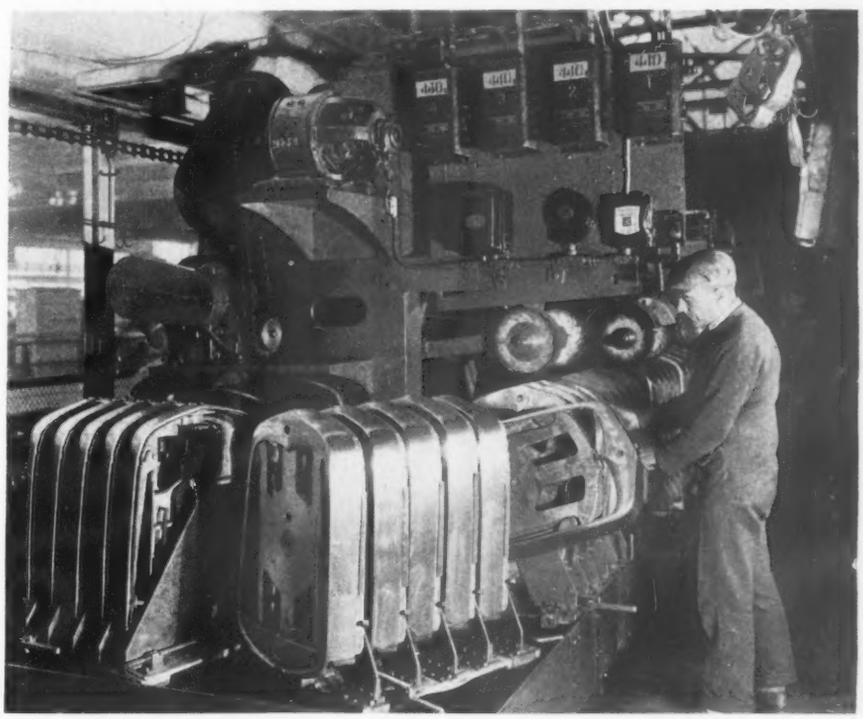
The machine is equipped with 48 sewed canvas wheels, 12 inches diameter and 3-inch face, operated at a peripheral travel of 9000 feet per minute. Sixteen wheels are employed for polishing each side of the shells and 16 for finishing the tops.

For the rough, or what might be called the first polishing operation, the shells pass under a series of wheels set up with No. 120 manufactured alumina, then under wheels set up with 150 material. These wheels are worked dry. Then comes the finishing with wheels set up with No. 120, 180, and 200 Turkish emery. The last two wheels are greased.

The foregoing cycle is on one side of the shell only and must be repeated twice, once for the top and once for the other side. In all, nine of the machines in question are used. Four machines perform the operations on the sides of the shells while five more machines are employed for finishing the face of the shells. In this operation the shell is located on a fixture so that it lays flat, in which position it is passed under a series of wheels as above outlined.

After passing under the final wheels the shells are cleaned and then color buffed. Color buffing is performed on automatic machines similar to the ones used for polishing with the exception that muslin wheels are used while the buffing agent is white coloring compound. The automatic buffing machines are a recent innovation, for while automatic polishing of the shells has been performed ever since the Model A Ford was put into production, the final buffing was performed by hand.

The entire problem of producing Ford radiator shells is an interesting one. By eliminating plating altogether much expense is curtailed, while the employment of automatic polishing and buffing machines cuts finishing cost to a minimum.

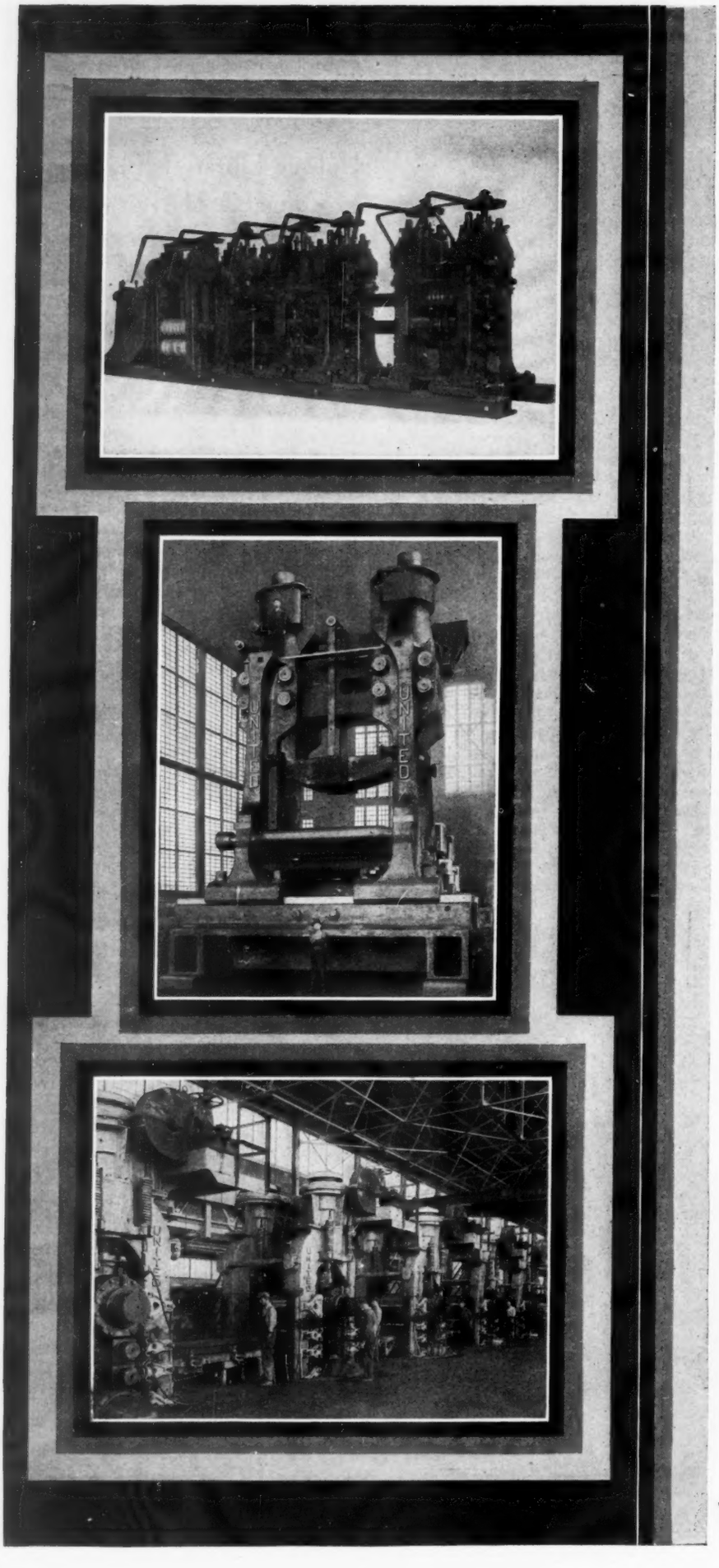


A 48-wheel automatic machine for polis hing corrosion-resistant radiator shells. The work is indexe d in three positions

Unique Library Is Presented to Columbia University

A complete library of books, pamphlets, government documents and other printed or written matter dealing with the science of weights and measures has been presented to Columbia university, New York, by Samuel S. Dale, Boston, former editor of the *Textile World Record*. The library, said to be the most comprehensive collection in its field in the possession of any educational institution, contains between 1100 and 1200 volumes, as well as some 700 pamphlets and contains works from 1520 to the present time. The works represent the accumulation of 30 year's research in this country and abroad by Mr. Dale who is an authority on weights and measures. Nineteen languages and all conceivable ideas on the subject are represented in the collection which was presented in memory of Mr. Dale's mother and father.

Class I railroads May 31 had 441,503 freight cars in good repair and immediately available for service, the car service division of the American Railway association announces. This was an increase of 12,944 cars compared with May 23, when there were 428,559.



Com Mill

"United" manufactures for the rolling mill industry of the world, a complete line of mills and auxiliary machinery for rolling Iron, Steel, Copper, Brass and other metals, as well as all types of rolls best suited for use in connection with these mills.

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Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Aircraft Ferrous Metals

Application of ferrous metals in aircraft construction by J. B. Johnson, 6½ pp., 4 tables. A paper presented at the annual meeting of the American Society for Testing Materials in Atlantic City in June.

The aircraft industry has been guided by the application of materials in other fields of engineering and has changed specifications only where it has been found that no products were available which would meet the peculiar demands of the industry. This paper briefly covers the various types of ferrous metals which have become standardized due to the co-operation between the national engineering societies, government bureaus and the industry in attempting to limit the number of steels to a minimum. The chemical content and physical properties of the several types have been tabulated with a brief summary of principal application.

Alloy Steel

Use in modern locomotives, in Vancoram Review, published by the Vanadium Corp. of America, Pittsburgh, July, p. 113, 3 pp.

Demand today is for freight locomotives to handle heavier trains at greater speeds over longer distances and for passenger locomotives capable of pulling greater loads without sacrificing speed. Use of stronger steels has been essential, not only to meet the higher stresses involved, but to keep the wheel loads within the specified limits imposed by the limitations of the roadway, and to lighten the reciprocating parts, thereby permitting better counterbalancing and reducing the dynamic augment, or hammer blow on the rails. Of the different alloy steels employed for forgings, castings and springs, those most widely adopted have been various types of vanadium steels: Carbon-vanadium cast steel in frames, cross-heads, wheel centers and other cast parts of lesser importance; carbon-vanadium forgings as axles, main rods, side rods, crankpins and piston rods; chrome-vanadium steel in forgings and in springs; nickel-vanadium cast steel in heavy-duty frames and crossheads. Detailed reasons for some of these applications are given.

* * *

Relative merits with respect to certain mechanical properties, by Bradley Stoughton and Wilbur E. Harvey, 17 pages, 13 tables. A paper presented at the annual meeting of the American Society for Testing Materials, in Atlantic City in June.

Taking as a basis about 50 binary or ternary alloy steels whose chemical analyses and mechanical properties have been published, some 1800 numerical calculations were made grading these steels in order of their relative standing according to the numerical value of the product of some functions of their strength multiplied by a function of their ductility or according to values of strength multiplied by Izod impact value. Up to this point the work was intended merely as a research into properties of the different types of steel and methods for comparing those properties. Only a few steels were chosen; namely, nickel, chromium, chromium-nickel, chromium-vanadium, chromium-molybdenum, medium manganese and silico-manganese. The reason for starting in such a small way was because the work was so time-consuming, and because the number of different factors which had to be taken into consideration in grading the qualities of steels was so large that a better start could be made by limiting the number of types and the extent of the field of application. Outstanding characteristics of some of the types are enumerated.

* * *

Discussion of development, components and properties in general, by E. C. Smith. A paper presented at the Chicago convention of the National Association of Purchasing Agents in June, 7½ pp.

Alloying was first represented by heating crude iron in charcoal containers to absorb carbon. Steel is defined in the modern sense as an alloy of iron and carbon essentially, cast in an initially malleable mass. Alloy steel may be defined as steel with special properties dependent upon the addition of one or more elements to the original material. The major special steels now used in the world involve tungsten, manganese, chromium, nickel, silicon, vanadium, molybdenum, cobalt and aluminum, arranged about in the subsequence of their importance.

Today the demand for nickel is more nearly the dominating demand. Chrome-molybdenum has fallen off and a part of its field has been taken by the various other alloys. Such shifts are due to the user's desire to meet changing price structures and maintain earnings during periods of falling profits.

During the late war and its succeeding period of upset, several new combinations have become commercial products. Among these are the heat resisting alloys, stainless irons and steels, nitralloy and cobalt magnet steel. With them has come a great number of special applications for the older products where refinements of practice have produced special materials; the deep stamping soft steel sheet; the modern welded pipe, and its related products in other welded jobs. Probably the most spectacular and far reaching developments have been the chromium combinations designed to withstand corrosion.

A New Alloy

Its composition and physical qualities in Metallurgia, June, p. 52, 2 tables, 2 charts.

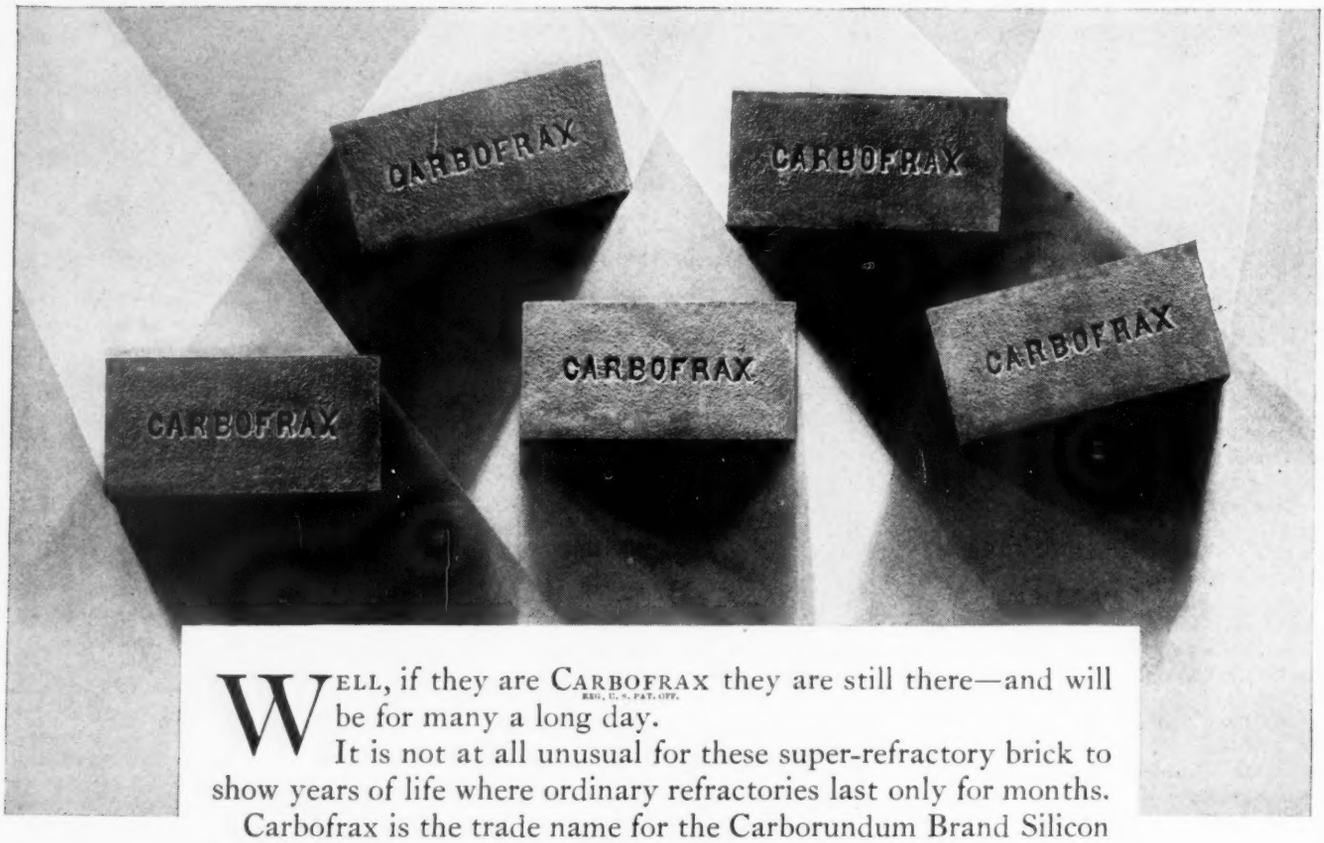
Recent investigations have resulted in the development of a new alloy known as Hiduminium R. R. 53. Its composition approximates 0.5 to 5.0 per cent copper, 0.2 to 1.5 nickel, 0.1 to 5.0 magnesium, 0.6 to 1.5 iron, 0.5 maximum titanium, 0.2 to 5.0 silicon and the remainder aluminum. The alloy is lighter than aluminum and may be die cast, sand cast or forged.

Aluminum Alloys

Improving the properties by heat treatment by T. W. Downes, in Automotive Industries, June 21, p. 944, 5½ pp., ills., 2 tables.

Although not so much percentage increase in strength in certain aluminum alloy sand castings is possible as with certain carbon and alloy steels, results involving as much as 100 per

Where are the Fire-Line Brick of Yesteryear?



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cent increase in tensile strength and nearly 400 per cent increase in elongation, or ductility, have been achieved under production conditions by certain combinations of chemical composition and heat treatment. The effect of silicon upon the properties of the aluminum alloy tested appears to be most marked in the elongation values. Magnesium in amounts up to 0.15 per cent produces a moderate increase in ultimate tensile strength but a proportionately larger decrease in per cent elongation. The metal is given a rating of fair in considering its casting qualities. If not overheated or held too long in the molten state before pouring, there is no danger of excessive shrinkage or porosity.

Centrifugal Castings

Chemical composition and mechanical properties discussed by J. E. Hurst, in Metallurgia, June, p. 54, 3 pp., 3 ills., 5 tables.

A form of test is described utilizing an annual ring test piece turned off the end of a cast pipe and pulled apart under a diametral load. A series of comparative tests of pipes made in sand molds by the sand spun process and the value of centrifugal cast material for piston ring manufacture are discussed in detail.

Cracks in Metals

A bulletin, No. 208, of the engineering department, University of Illinois, Urbana, Ill.

Results of a study of the development of slip lines, strain lines and cracks in metal subjected to repeated stress are recorded. The metals studied include ingot iron, 0.20 per cent carbon steel, chrome-nickel steel, stainless iron, brass, monel metal and duralumin. Numerous micrographs and macrographs taken during the progress of the tests are included.

Creep of Metals

Description of a machine for measuring this change at elevated temperatures, by A. E. White, C. L. Clark and L. Thomassen. A paper presented at the semiannual meeting of the American Society of Mechanical Engineers in June, 3½ pp., 4 ills., 1 chart.

A special type of machine has been designed for measuring the creep of metals at elevated temperatures. Due to the slight changes in dimensions encountered, such an apparatus must be sensitive to small variations. This particular machine is capable of measuring variations in length of the test specimen to about 2.8 millionths of an inch per inch. The three essential parts of a creep-measuring device are listed as (1) a means of applying and maintaining a constant load, (2) a means of obtaining and maintaining constant a given temperature, and (3) a means of accurately determining any deformation produced in the test piece. The manner in which this machine fulfills each of these conditions is detailed.

Radiography Testing

A summary of the developments of testing metal by X-ray and a discussion of the application of the method in aeronautics by John T. Norton, in Aviation, June 28, p. 1261, 3 pp., 7 ills.

Because of the length of time and the relatively high cost, the routine examination of a large number of castings is not a practical procedure, but in aircraft work there are many instances of parts which cannot be allowed to fail in service. Here is a method which gives a complete and positive view of the interior. Various applications of the method to materials, which the aircraft manufacturer uses, is discussed.

Wire Rope

Its principles and uses discussed by Walter A. Scoble, in Metallurgia, June, p. 63, 1¾ pp.

Twisting under tension can be eliminated by balancing the torques. The length of the lay of a rope of a given size not only affects its tendency to twist but influences many other rope properties. Diversified data are given covering the different fibers used in the formation of rope cores.

FABRICATION:

Drop Forging Dies

Their construction discussed by George A. Smart in Heat Treating and Forging, June, p. 735, 3½ pp., 12 ills.

The scope and possibilities of drop forging have advanced to such a state of perfection that many articles now are being forged with ease and at a considerable saving in cost. The method in which flanged wheels are forged, the layout and construction of bending fixtures, the forging of a combination tier tool and of a large size steering knuckle are explained in detail.

Electric Arc Welding

Its progress and application by E. D. Lacy, in Metallurgia, June, p. 61, 2 pp., 3 ills.

Achievements obtained in the shipbuilding industry in England by the use of the electric arc welding process are cited by the author. Interesting details are given comparing the cost of electric welded and riveted barges. Procedure for constructing mercantile vessels also is explained.

* * *

Welded-on overlays discussed by Miles C. Smith, in Welding, June, p. 535, 5 ills.

A feature of the electric arc for depositing overlays is that the overlay material is heated quickly to a fusing temperature, deposited and then allowed to cool. In depositing an overlay the material or rod should be utilized as the positive electrode and the negative pole of the arc then is the parent metal to be overlayed. Generally speaking, the electric application of an overlay should follow the same general code of procedure as the oxyacetylene application. Overlay materials are compounded of metallic or nonmetallic elements that will produce hardness in their fused deposits.

Galvanizing

A survey of the factors which influence smoothness by Wallace G. Imhoff in Heat Treating and Forging, June, p. 729, 3 pp., 1 ill.

Steel to give a smooth zinc coating must be sound, degasified, cohesive and plastic. The surface finish of the coating is dependent upon the chemical analysis and the surface condition of the steel base, pickling, draining, drying, fluxing, bath temperature and composition, handling, quantity coated and the temperature of the cooling water.

Heat Treating Tools

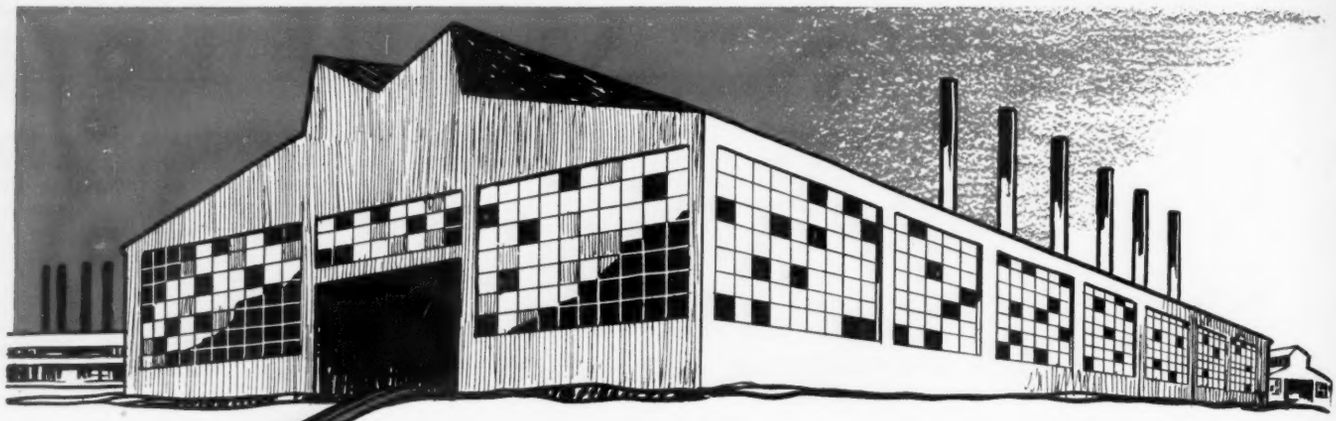
Sequence of heat treating operations are described by C. L. Fisher, in Heat Treating and Forging, June, p. 775, 3 pp., 6 ills.

Manner in which tools are submerged in quenching, direction of movement of the tools and the agitation of the bath while the tool is cooling from quenching heat are important factors. Gas at 15 pounds pressure for heating tempering units lends itself more readily to electric control than an air blast used with gas at ordinary pressure. The method of carburizing and oil hardening and the equipment employed are discussed in detail.

Oxyacetylene Welding

Use in fabricating sheet metal products, in Oxy-Acetylene Tips, published by Linde Air Products Co., New York, June, Page 251, 5 pp., 15 ills.

This article enumerates some of the better known industrial and domestic sheet metal products which are fabri-



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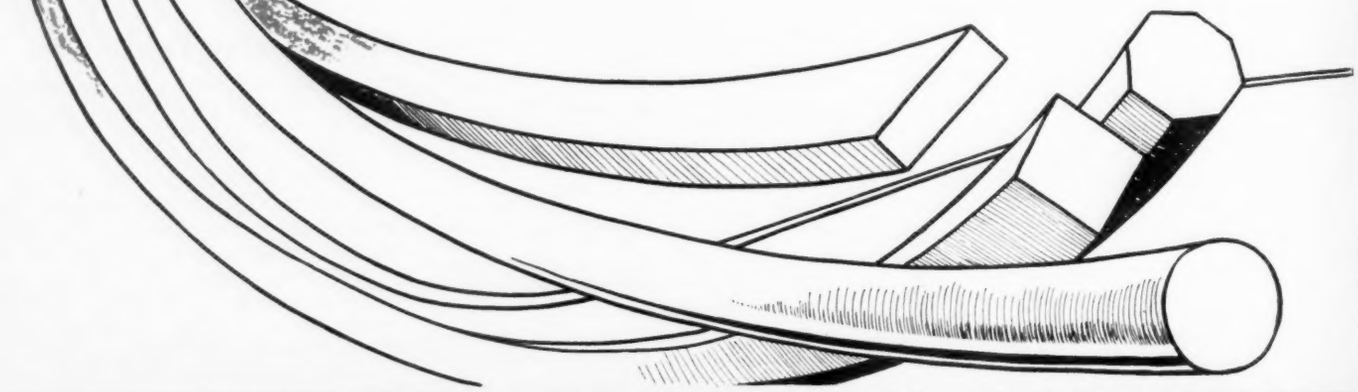


Washburn Wire Co.

Phillipsdale, R. I.

3*

cated regularly by the oxyacetylene method of welding. Among these products are kitchen utensils; hospital equipment; household and office furniture; doors, window sash and trim; barrels; aircraft, automobiles; textile machinery; heating and ventilating equipment; street cars; refrigerators; and chemical equipment. Welding technique and procedure control are discussed in a limited and general way.

Resistance Welding

Advantages of projection welding discussed by J. A. Weiger, in Welding, June, p. 538, 2½ pp., 5 ills.

Modern projection welding machines must be capable of delivering large amounts of current during accurate time intervals and exert tremendous pressure evenly distributed over the work. The diameter and height of the projections on the metal will vary with the gage, temper and composition and upon the space allowed, such as close to the edge or on narrow strips. An alloy of copper and tungsten has been found to be the best material to face projection welding dies and electrodes.

Welding Shop

A description of a welding plant owned by three companies by Joseph C. Coyle, in Welding, June, p 545, 2½ pp., 9 ills.

Efficient and economical means of fabricating, electric welding and acetylene cutting and welding are employed. Steel plates are cut on a large gate shear, a rotary shear and by an automatic oxygen cutting machine. Fabrication by welding of a filter and a vacuum cooking tank is described.

PRODUCTION:

Bessemer Steelmaking

Output of converters becomes more important by Joseph R. Miller, in Blast Furnace and Steel Plant, June, p. 973, 1½ pp., 1 ill.

Because certain steel products are best made from bessemer steel, and of the lower conversion cost and adaptability of the converter in handling large quantities of hot metal, the bessemer process has survived in the face of the untoward circumstances that have existed. Much attention is being paid to improvement of quality and to a study of the maximum utilization of existing bessemer capacity. The tendency in vessel design is toward larger diameters with less depth of metal above the tuyeres.

Furnace Flue Gases

A bulletin, No. 20, of the engineering experiment station, University of Illinois, Urbana, Ill.

Concentration of sulphur trioxide greatly affects the temperature at which liquid will form. Data are presented to show that the sulphur trioxide in the furnace gases does not originate by oxidation of sulphur dioxide, but by the decomposition of the sulphates in the coal. A rough estimate of the dew point can be made if the sulphur trioxide concentration with the usual Orsat data for the gases is known.

Malleable Cast Iron

Effects of nickel discussed in Metallurgia, p. 67, 1½ pp., 2 tables.

Experiments conducted by J. V. Murray, which gained for him an award from the Staffordshire Iron and Steel institute. The best mechanical results are found when nickel content is about 1 per cent. From this amount upwards the general physical values decrease. The amount of nickel, which can be used in malleable work is limited to about 3 per cent. Conclusions supported by photomicrographs substantiate the contention that with 1 per cent nickel the increases in tensile, bend and elongation values are due to increased amount of pearlite present due to this pearlite being more stable which results in a more homogeneous structure and a finer structure of the pearlite especially at the core.

Mixed Gases

A technical paper, No. 450, of the bureau of mines, Washington, 38 pp., 6 ills., 18 tables.

Results of numerous experiments on the inflammability of gas mixtures consisting of methane, hydrogen, carbon monoxide, nitrogen and carbon dioxide in varying proportions are presented. The data show that it is possible to calculate fairly closely the limits of inflammability of mine-fire gases, gases from mine explosions, detonation products from explosives, blast furnace gases and other gases of similar character.

Open-Hearth Furnace

A description of the Stevens-type furnace by Charles Longenecker, in Blast Furnace and Steel Plant, June, p. 971, 2½ pp., 4 ills.

An open-hearth furnace of 100 tons capacity equipped with automatic control has been operated by the Laclede Steel Co., Alton, Ill., for over a year. Oil of 8 to 12 degrees Baume and preheated to 160 degrees Fahr. is used as fuel. Due to the melting condition, the charge contains 20 per cent less pig iron than is customary. The melting rate will average 10 tons an hour. An average of 27 gallons of oil is used per ton of ingots produced.

Pulverized Fuel

Method of firing for metallurgical work in Metallurgia, June, p. 41, 4 pp., 7 ills.

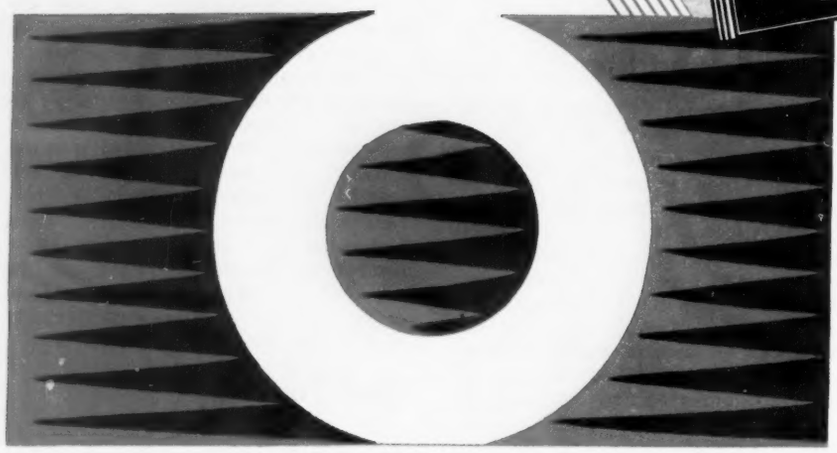
Under pulverized coal conditions the charging, firing and tapping of malleable iron furnaces can be regulated to a definite schedule. In Germany a great measure of success has been obtained in the use of this fuel as auxiliary firing for cupolas, 30 per cent reduction in coke having been effected, 20 to 40 per cent increase in the output and a hotter casting metal. The more confined the combustion area the greater must be the degree of uniformity and fineness of the fuel. Progress in the knowledge of pulverization and methods of obtaining short flame combustion largely have overcome the expenditure previously attributed to pulverized-fuel firing, particularly combustion chamber reconstruction.

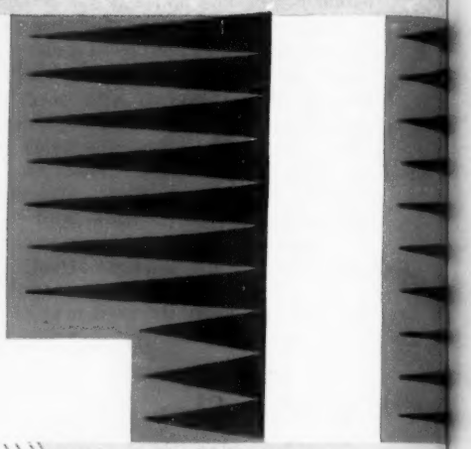
Steel Founding

Practice in Australian plants, by Daniel Clark in Transactions and Bulletin of American Foundrymen's association, June, p. 146, 22 pp., 4 ills, 2 tables. A paper presented at the Cleveland convention of the American Foundrymen's association in May.

Reviews the history of steel founding in Australia and discusses industrial conditions affecting standardization of methods and wage payments. The basic wage is perhaps the highest in the world, because labor governments have been largely in control. Apprentice training lasts for a 5-year period. All processes of steelmaking are used with the electric melting furnace supplanting the converter. Furnaces are basic lined because of scarcity of low-sulphur and low-phosphorus scrap. Discusses lining mixtures, melting and pouring temperatures, molding sands, molding practice and chemical and physical properties of castings. Chemical analysis is considered of doubtful value. Australian foundries are engaged almost entirely in jobbing work for mines, quarries, street railways and railroads.

The Syracuse, N. Y., chapter of the American Society for Steel Treating recently elected the following officers for the year 1930-31: Chairman, M. E. Cummings, Crucible Steel Co.; vice chairman, G. C. Farnsworth, Brown-Lipe-Chapin Co.; and secretary-treasurer, S. W. French, Syracuse Lighting Co.





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New Books Worth Reading

SCIENCE ECONOMICS BUSINESS

Electric Furnace Bibliography

Bibliographie der Elektrometallurgie des Technischen Eisens (Bibliograhpy of the Electrometallurgy of Technical Iron), by E. Hothny, paper 8¼ x 11½ inches, 66 pages, published by the Verein Deutscher Giessereifachleute, Berlin, Germany, and supplied by STEEL for $2, plus 15 cents postage; in Europe by the Penton Publishing Co. Ltd., Caxton House London, for 10s, net.

During the past 30 years much literature has been published on the electric furnace and its application to the iron industry. However, it is not readily accessible and for that reason the author was commissioned by the electric furnace committee of the Association of German Foundrymen to arrange a bibliography of the world's literature on the electric furnace. It contains 26 divisions covering books on the electric furnace; electrodes, equipment of the furnace; refractory linings; indirect, direct and low frequency induction furnaces; high frequency furnaces; resistance furnaces; electrometallurgy of steel and processes; electric furnaces in the foundry; electrically heated ovens, etc.

◆

Second Edition on Gray Iron Foundry Practice Issued

The Principles of Iron Founding: by Richard Moldenke; cloth, 654 pages, 6 x 9 inches; published by the McGraw-Hill Book Co. Inc., and supplied by STEEL for $6 plus 15 cents postage, and in Europe by the Penton Publishing Co. Ltd., Caxton House, London, for £1 10s 6d, net.

This is a second edition of a well known work first issued in 1917. Its purpose is to elucidate the principles underlying all the processes involved in the art of iron founding. Advent of high test cast iron has induced the author to revise the first edition considerably.

Dr. Moldenke's observations and experience of a lifetime spent in his chosen field are compiled in this present volume. The scope of the work is indicated under the following 13 chapter headings: Historical, industrial status of the foundry, foundry organizations, outline of iron metallurgy, outline of iron making processes, properties of cast iron, classification of castings, foundry raw materials, the technology of combustion, melting processes, melting processes continued, mixture making, testing cast iron.

A glossary of foundry terms is included, also an appendix containing standard specifications for purchasing sampling, testing and methods of analysis of foundry materials and products. The book is highly recommended to all progressive foundrymen.

◆

Letters of Krupp Reveal Problems of Steelmaker

Krupp, His Letters, Edited by Wilhelm Berdrow; cloth, 416 pages, 6 x 9 inches; published by Lincoln MacVeagh, the Dial Press, New York, and supplied by STEEL for $5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for £1, 5s net.

Revelation of self through day-to-day letters on business and personal matters is likely to be deeper and clearer than biography or autobiography. Alfred Krupp, son of the founder of Krupp's, wrote voluminously and intimately as to his own feelings and principles, not as a record, but to impress his ideas on others. These letters. collected, edited and presented in this volume, give a picture of the great ironmaster difficult to conceive as possible from any other source.

Contrary to usual collections of letters this book is absorbing reading. It pictures the development of better steel, the high principles of Krupp, the obstacles he met and his eventual disappointment at his accomplishments. An interesting picture is presented of the constant and unexplainable opposition he met from his own government in his efforts to give to Prussia the world's best armament.

Autocratic in carrying out his policies, he was filled with the highest ideals for his workpeople and their best interests. All he asked was an honest return and some degree of the same interest toward him. An idealist, a hater of war, his life brought him in contact with sordid traders in patriotism; in making guns and ships of war, from purely patriotic motives, he was met by opposition of bureaucrats who were jealous of one who could think and invent faster then they.

For general history and for a glimpse behind the scenes of the period when steel was being born in mass production this is a valuable volume.

Business in the Southland

Blue Book of Southern Progress, 290 pages, 6 x 9 inches; published by *Manufacturers' Record*, and supplied by STEEL for 50 cents, plus 15 cents for postage; in Europe for 2s 6d, net by Penton Publishing Co. Ltd., Caxton House, London.

Each year this blue book is issued, containing a wealth of information as to the production and commerce of the southern states.

Statistics are comparative, with the present contrasted with 1900 to 1910, thus setting up markers by which progress may be measured. To anyone interested in the South this is an indispensable publication.

◆

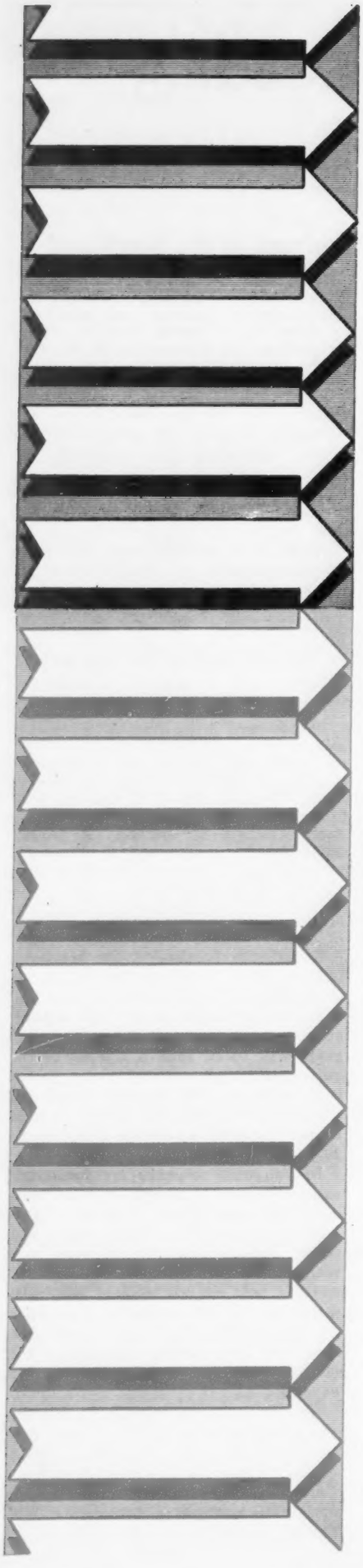
Is St. Lawrence Waterway an Economic Necessity?

The Future Movement of Iron Ore and Coal in Their Relations to the St. Lawrence Waterway, by Fayette S. Warner, industrial research department, Wharton School of Finance and Commerce, University of Pennsylvania, cloth, 6 x 9 inches, 195 pages, published by University of Pennsylvania Press; supplied by STEEL for $3, plus 15 cents postage.

Iron ore in Lake Superior district is being gradually depleted, and eventually a large portion of the ore used in this lower lake district will have to be imported. This fact is well understood in the industry. The author endeavors to indicate when the imports will be of such a size as to require additional waterway transportation facilities. He forecasts need for importing 12,000,000 to 13,000,000 tons of ore by the St. Lawrence water route 20 years hence.

British coal reserves are becoming exhausted and exports of American coal will have to be increased. The coal originates in territory nearer the Great Lakes than the Atlantic seaboard. The author predicts that 5,000,000, to 7,000,000 tons of coal will move out by way of the St. Lawrence by 1945. With other bulk freight, he computes a minimum tonnage of 35,000,000 tons and a maximum of 52,000,000 tons.

The study is an attempt to answer the question whether the traffic that would be available would be sufficient to justify the St. Lawrence waterway project. Large and diversified groups of middle western manufacturers will find the book informative.



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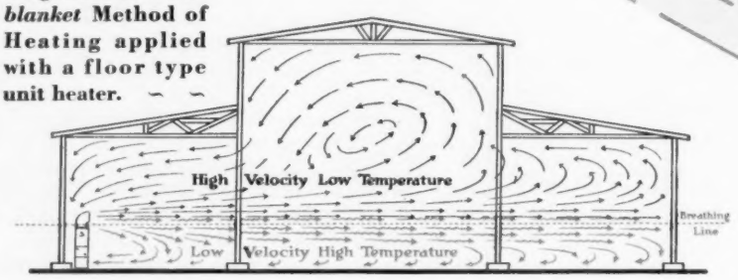
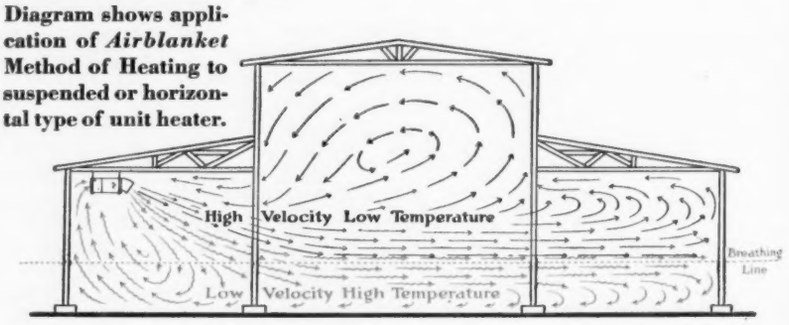
FLOOR TYPE

Diagram shows *Airblanket* Method of Heating applied with a floor type unit heater.



HORIZONTAL TYPE

Diagram shows application of *Airblanket* Method of Heating to suspended or horizontal type of unit heater.



THE GREATEST HEATING

Machine Tools and Shop Equipment

"Without machine tools modern machinery could not be built."

—Joseph W. Roe

Machine Replacement Factor Determined by Formula

NO INDUSTRIAL executive can afford to revamp his machinery and equipment at will and it would often be a ruinous process if he did. But a formula for machinery replacement has been developed and its constant operation might well be applied to industrial practice. This formula and accompanying comments appear in a book, "The Industrial Executive," written by Col. Benjamin A. Franklin, published by the Ronald Press Co., New York, and quoted in a recent issue of *Industry*, the organ of Associated Industries of Massachusetts of which Col. Franklin is president..

Machinery and equipment, especially the former, wear out, but the results of wear and tear can be so largely offset by care, repair, and replacement as to be economically distributed over a long period. The greatest destroyer of the comparative value and efficiency of the machinery is obsolescence—the result of the invention of new machinery which will accomplish much greater volume in a given period of operation.

In this advancing age of machinery, in the last analysis, the vital problem of production is not so much what can be obtained per man-hour, as what can be obtained per machine-hour, since that is the limiting factor of the operator, and may largely reduce the product the operator is capable of making. If to these considerations is added the fact that the tendencies, both of competition and the buyer's demand, are for lower prices, it will be evident that the question of machinery and equipment is a constant and extremely important one in the profitable life of the present-day industrial unit.

In the modern and advancing competition, the maximum production he can obtain per machine-hour from the machines he has, is a vital matter to the executive. It is his internal daily problem. But he must be alert to discover what the machine-hour production would be if he possessed the latest machinery designed for the work —machinery which is or will be possessed by his competitors. This is his external problem. It demands that he keep in touch with his machinery market, which is no difficult problem.

Formula Solves Problem

To solve his internal problem the executive can, with the aid of his cost system, work up his own formula. In so doing he has two aids: The first is the fact that the cost per machine-hour involves not only the labor cost but the expense rate per machine-hour, and it most frequently happens that the latter is the larger of the two items. Through a proper cost system it is not difficult to figure what an annual saving would amount to in reduction of the total cost of the operation with the latest designed machine. With this saving in mind, and the net cost of replacement, decision may rest on the calculation as to how long the saving must operate to replace the added investment and begin to turn back to profits its whole amount or otherwise to place the unit on a stronger competitive basis. Certainly machinery must from time to time be replaced. Such a formula, constantly considered, is the scientific and sensible basis for replacement.

The second aid in the solution of this problem lies in depreciation. The wise executive appreciates the necessity from the accounting point of view of a proper allowance for depreciation, both from wear and tear, and from obsolescence. The tax laws recognize these depreciations of value. Too often, however, depreciation is considered merely an accounting gesture. Yet depreciation from the common-sense, business point of view ought not merely be set up on the books as a reserve to cover the definite losses which occur, and to ameliorate taxation, but also to be put into the actual cost of manufacture so as to make a complete basis of cost for price-fixing. This must be done in order to obtain the return of this loss.

Depreciation has, however, a more important function. It is a definite calculation of the amount of waste of capital invested, and the main purpose of setting it aside is to create a reserve to be spent in new machinery to replace the calculated waste. In practice, therefore, depreciation reserve is the pool into which the executive dips to obtain funds withheld actually from the sale of production, to keep his investment in machinery and equipment up to its true normal value and efficiency.

With this depreciation in mind, the formula for machinery replacement becomes still more effective from the possible and practical point of view. Its proper operation in the past, with common sense and judgement, would place many industrial units today in a much happier operating and profit-

$$\frac{\left(\begin{matrix}\text{Cost of}\\ \text{new machine}\end{matrix}\right) - \left(\begin{matrix}\text{Salvage of}\\ \text{old machine}\end{matrix}\right) - \left(\begin{matrix}\text{Accumulated depreciation}\\ \text{on old machine}\end{matrix}\right)}{\left[\dfrac{\left(\begin{matrix}\text{Hourly cost of}\\ \text{old machine}\end{matrix}\right)}{\left(\begin{matrix}\text{Hourly production}\\ \text{of old machine}\end{matrix}\right)} - \dfrac{\left(\begin{matrix}\text{Hourly cost of}\\ \text{new machine}\end{matrix}\right)}{\left(\begin{matrix}\text{Hourly production}\\ \text{of new machine}\end{matrix}\right)}\right] \times \text{Annual production}}$$

= Years required for new machine to return its additional investment

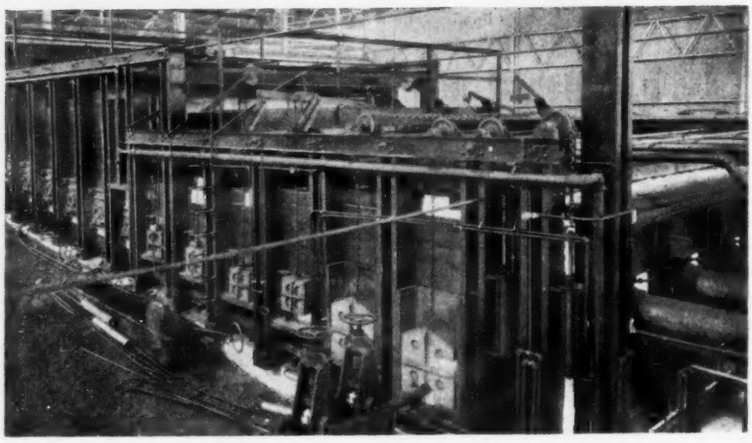
Representation of a typical case:

$$\frac{\$6000 - \$1000 - \$3000}{\left(\dfrac{\$0.80+2.20}{12} - \dfrac{\$0.80+2.50}{20}\right) \times 25{,}000} = \frac{\$2000}{\$2125} =$$ Something less than one year, or, with a correction for interest, say one year.

DETRICK

Suspended Arches—Walls for Heating Furnaces

The reproduced photograph at right shows a typical Detrick installation—a ninety-four foot billet heating furnace in the Gambrinus plant of the Timken Company. The *suspended* arch principle employed by Detrick means flexibility of design, allowing for expansion and contraction of the refractory material without damage, assurance that the roof will not collapse, and makes it easy to replace burned out patches without disturbing other sections of the roof.

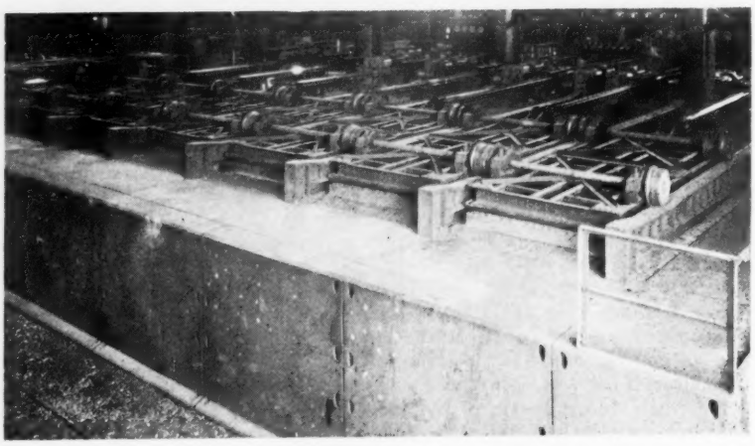


94-Foot Billet Heating Furnace with Detrick Roof

And Soaking Pit Covers

Soaking Pit Covers embodying the Detrick Suspended principle consist of center-grooved tile suspended by cast iron bars from structural steel beams spanning the pit and framed into the outside structural members of the moving frame. The use of suspended tile eliminates the possibility of cover failure due to constant jars and shocks; provides a better seal on the pit walls and makes it possible to repair the cover in small sections.

Wherever used—arches, walls, roofs—the Detrick principle allows for expansion and contraction of the refractory material without danger of damage.



Detrick Covers on Chapman-Stein One-Way Fired Soaking Pits with Tile Recuperator.

There are Detrick Engineers stationed near you. They are experts in furnace design and their advice and assistance is yours for the asking. Without cost or obligation they will gladly point out the advantages of Detrick construction in your own plant.

M. H. Detrick Co.

140 S. Dearborn St., Chicago, Ill.

Our sixty-four page catalog gives illustrations and full details concerning Detrick Arches, Walls and Roofs. Write to our nearest office for a copy.

New York: 50 Church St. Philadelphia: 1421 Chestnut St. Pittsburgh: Empire Bldg. Detroit: Murphy Bldg. San Francisco: Russ Bldg.

making condition. Its proper operation in the future, with both foreign and newer locality competition, will be the salvation of older industrial localities. Its operation is entirely in the line of scientific management.

Such a formula might be stated mathematically as shown at the lower part of page 90.

In this formula a higher expense rate is allowed for new machinery. This may look like an unusually favorable case, but there are many cases like it. At any rate, each case so worked out will give the executive a basis for judgment, and in many cases two points of possible further advantage are a greater annual production to sell, and the putting of the unit on a better competitive basis.

Machine production costs, however, cannot be considered merely as to the single machine, for complete production is almost invariably a matter of group machinery operation. The cost, therefore, of this production, if considered from the economic point of view, as of course it must be, involves two important elements. The first of these is straight-line and continuous production. If the best value is to be obtained from one machine, it is important that the raw or semifinished material be promptly fed to it and taken away from it. When, therefore, the grouping of machines to bring about finished production is considered, both the questions of readiness of material and transportation become important.

A second most important element involves the equipment of the industrial unit both as to the machines themselves and transportation to, between, and from them. Transportation should be arranged not merely to make it as prompt as possible but most economical and independent of labor cost. Here again a proper cost system may operate quickly with data and calculation to develop a formula, and to show savings to be made by installation of equipment, both to facilitate production and cheapen transportation. When this is done, a proper balance between cost of equipment and its liquidation by savings made with consequent decision is bound to be shown.

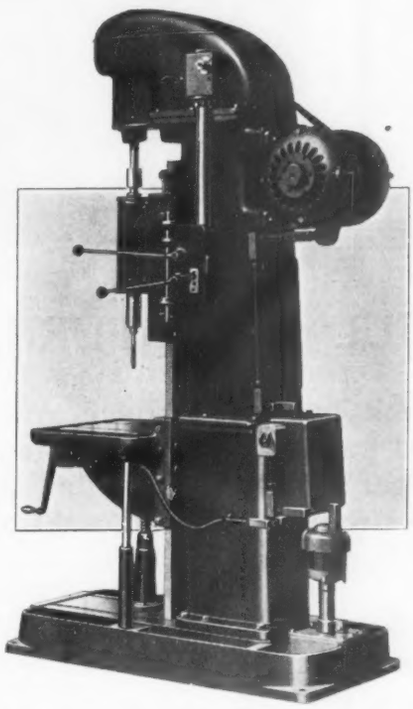
◆

Vertical Drill Has Simplified Control and Operation

National Automatic Tool Co., Richmond, Ind., has developed a vertical single-spindle driller equipped with a semiautomatic hydraulic feed. The driller, shown in the accompanying illustration, has a simplifed control which permits instant and positive control of the head and is arranged with a flat slide adapted especially for the mounting of either single or multiple-spindle drill heads.

The operating valve trip mechanism, of the load and fire type, operates semiautomatically through adjustable dogs which cause the head to go through its cycle of rapid traverse down to the work, feed for the drilling operation, rapid traverse up and away from the work and stop at the end of the stroke. The operator starts the cycle by means of a manually-operated hand lever, then the remainder of the operations are automatic.

Near the starting lever is located



Vertical single-spindle driller has semiautomatic hydraulic feed

a second control lever used for an emergency stop or to change the control mechanism from semiautomatic to hand control. The movement of the head may be stopped at any time during the cycle by operating this second lever. After that, the operator can move the head independent of the automatic trip dogs by means of the first lever.

The driving motor is a 5-horsepower ball bearing mounted open-frame type, mounted on the column near the top and at the rear of the machine. The first speed reduction is made from the motor to the neck by a multiple V-belt drive. The second reduction of speed in the neck is made through a pair of hardened alloy steel spiral bevel gears. The next two speed reductions are made through hardened alloy steel pick-off gears. These pick-off change gears allow a range of spindle speeds from 100 to 1300 revolutions per minute. The spindle drive is a hardened alloy steel 6-spline sleeve. A centrifugal pump is provided to supply coolant.

◆

Disconnecting Switches Simple and Compact

General Electric Co., Schenectady, N. Y., is announcing a new line of disconnecting switches which are simple and compact in construction and are made single-pole, single and double-throw, front-connected, back-connected, and combination front and back-connected. The blade of the switch is made from hard-draw switch copper, and consists of two laminations. It has noncorrodible hardware and phosphor bronze spring washers which provide self-aligning contact pressure. The opening-eye of switches without blade latch is attached directly to the blade laminations, and is sufficiently large to permit ready insertion of a switchhook.

The opening-eye of switches with blade latches is a casting, having a large opening and a cam on either side. One cam functions to release the latch, and the other operates in conjunction with the latch to provide a seal-break feature, which starts the opening movement of the blade.

The blade latch consists of two malleable iron castings which are hinged together, and a noncorrodible spring. It positively locks the blade closed under any electromagnetic stresses tending to cause opening, yet when acted upon by the opening eye, the latch is released and the seal-break features actuated to start opening. In addition the latch is constructed so that it serves as a blade guide.

◆

New Metal Affords Strength and Resistance to Wear

Link-Belt Co., Indianapolis, announces a new line of cast chains of remarkable strength and durability. This product is the result of extended research to provide longer life for drive and conveyor chains operating under heavy loads or abrasive conditions. Experimentation, started four years ago, led to the discovery of a new method of processing malleable iron which so altered its physical characteristics as to make it a distinctly new metal. Therefore, it has been designated by the name of Promal.

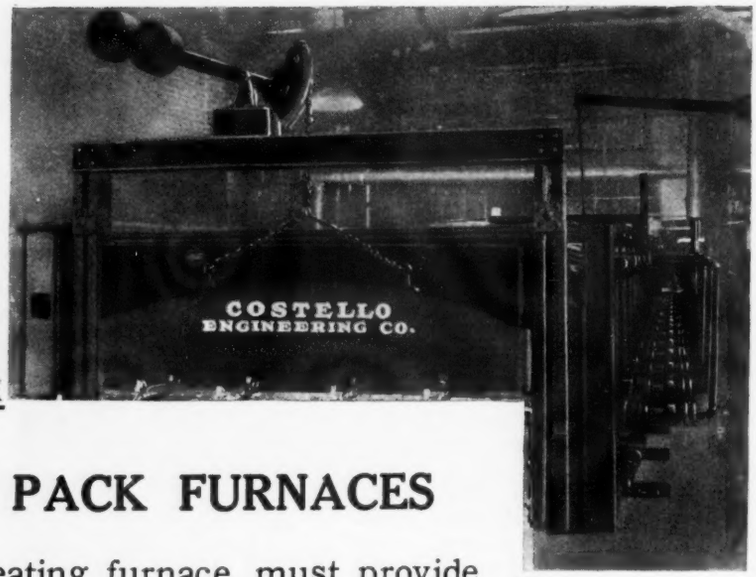
The new metal has an average yield point of 45,000 pounds, an average ultimate strength of 65,000 pounds, an average elongation of 14

COSTELLO

PACK FURNACES

List of Products

Continuous Pair Furnaces
Sheet Furnaces
Continuous Pack Furnaces
Blue Annealing Furnaces
Box Annealing Furnaces
Car Type Annealing Furnaces
Normalizing Furnaces
Furnaces for Special Requirements



SUCCESSFUL PACK FURNACES

A successful pack heating furnace must provide uniformly heated packs and must protect the pack while hot by proper atmosphere. The Costello pack heating furnace produces these conditions by two main features of their construction.

One Underfiring with long soft flame heating assures uniformity of pack temperature and soft steel.

Two Costello method of regulating furnace provides for maintenance of uniform atmosphere and temperature differential in the hot zone.

A discussion of your pack heating conditions with a Costello engineer will enable you to produce better sheets.

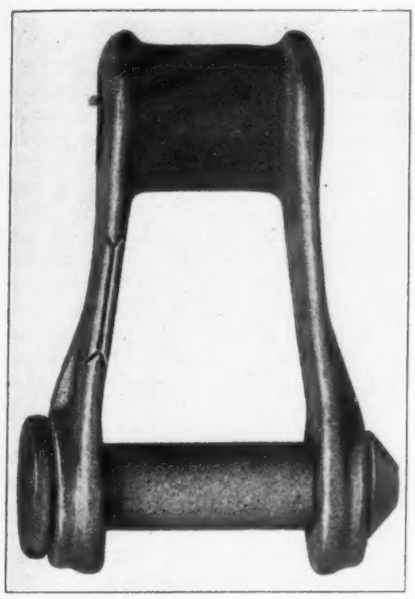
COSTELLO
Engineering Co.
519 Oliver Bldg., Pittsburgh, Pa., U.S.A.

FURNACE DESIGNERS AND CONTRACTORS
ENGINEERING

per cent and a brinell hardness of 170-190.

The metal thus has to a high degree the qualities desirable in sprocket chain material; great toughness to resist extreme tension without permanent stretch; high strength in proportion to weight and size; and hardness that affords great resistance to abrasive wear. The combination of these characteristics in the new metal gives chains made of it their durability.

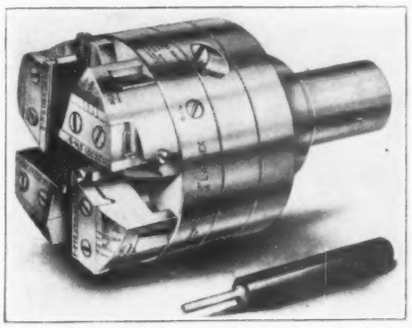
Due to brinell hardness, chains of the treated metal withstand prolonged abrasive wear. The metal has an exceptionally high yield point or elastic limit which engineers recognize as of greater importance than ultimate strength. In addition the metal is tough and ductile so that it withstands shock and fatigue loads. High temperature reduces its tensile properties somewhat, but temperatures up to 1000 degrees Fahr. will not cause it to become brittle.



Chain link made of newly developed metal which withstands shock and fatigue loads

Although laboratory tests indicated long wearing qualities of the special chains when they first were developed, they were withheld from the market for over three years to permit extensive field tests.

Processed malleable chains are recommended particularly for four general classes of service: (1) Chain drives, elevators and conveyors operating under gritty or abrasive conditions; (2) chain drives where great strength is required; (3) drag, scraper and flight conveyors where the chain drags and is subject to abrasion; and (4) heavy-duty drives of comparatively high speed, short centers and large sprocket ratios.



Die head is applicable for close-to-shoulder threading

Internally Tripped Die Head for Close Threading Work

Landis Machine Co., Waynesboro, Pa., has developed an internally tripped die head which is applicable for close-to-shoulder threading on work which varies in length and on work where a uniform length of thread is required. This new head, shown in the accompanying illustration, is well adapted for threading operations where a fixed stop cannot be used to open the die head, or where the work is held loosely in a fixture, as on a drill press table.

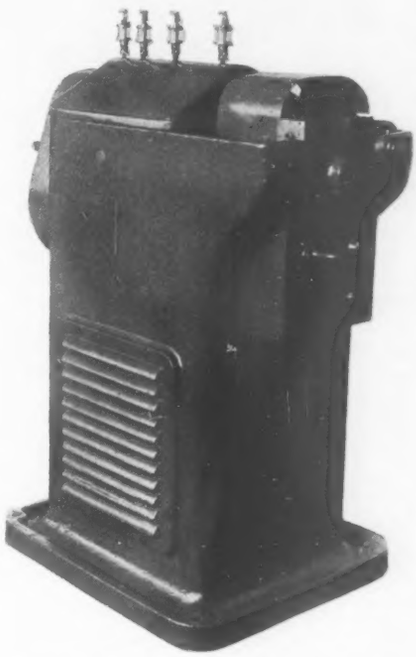
The tripping mechanism consists of a plunger held in the shank of the head, the shank being drilled and tapped to accommodate it. The plunger is adjustable and can be set to any thread length within the capacity of the head. The internally tripped head, when used on automatic screw machines, eliminates the necessity for accurate timing of the head opening cams as the head is positively tripped when the end of the work comes in contact with the tripping plunger.

When used on a machine such as a drill press, chucking is unnecessary, a socket or floating fixture being used to hold the work. For threading parts such as spark plug bodies, pipe plugs, pipe bushings, BX connectors, bolts, screws, etc., were the thread length remains the same and where the part must be threaded close to a shoulder, this head is particularly suited.

High Production Speed on Bolt Pointing Machine

Economy Engineering Co., Willoughby, O., has developed a semiautomatic pointing machine in which, except for inserting and removing the blanks, every movement is performed automatically. The machine points bolts, studs or rods ¼ to ¾-inch diameter and 5½ inches or more in length at a rate of from 1200 to 2400 pieces per hour. In operation the piece is simply inserted against the stock gage where it is gripped automatically on the round; the stock gage moves aside and the pointing head moves forward automatically and finishes the point. The gripping jaws then open and the finished piece is exchanged for a new blank.

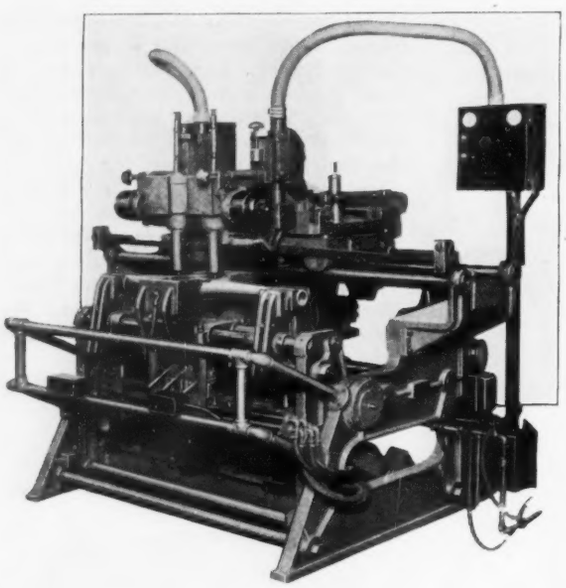
In construction, the machine, shown in the accompanying illustration, is unusually simple, sturdy and compact. Change gears are located in the oil-tight housing at the rear. The spindle is driven by a silent chain from the motor mounted in the base. For adapting to different size bolts, it is necessary only to adjust pointing head and gripping device, both of which are readily accessible.



Semiautomatic operation features bolt pointing machine

Bench Lathe and Hand Screw Machine Redesigned

Hardinge Brothers Inc., Chicago, has redesigned its line of motor-driven bench lathes and hand screw machines to provide more strength and rigidity in the machines. The new machine, shown in the illustration on Page 94, is designed with



Automatic welder is used to manufacture rear axle housings

a completely enclosed headstock, incorporating V-belts throughout. The drive from the reversing unit to the headstock spindle is obtained by the use of three V-belts which transmit power to the spindle without chatter. A range of five sizes, from ½ to 1-inch collet capacities, with 7 and 9-inch swings, is being offered. The lathe bed has been designed to be slightly heavier than the old style. The tailstock is also heavier in construction with an improved locking device and incorporates a No. 1 Morse taper in the spindle.

Speed Range Clutch Controlled

The transmission has a speed range from 140 to 1600 revolutions per minute with high and low speed controlled by a clutch located in front of the bench and reverse controlled by a reversing gear box. To expedite the change of belts on the cone pulley, the motor is mounted on an adjusting plate, which relieves tension on the belt while shifting. The transmission runs in self-aligning grease-packed ball bearings throughout. It is connected to the bench with rubber mountings between the transmission and the bench top to deaden vibration.

The reversing unit is independent of the transmission and lathes are available with or without reverse. The independent unit is used to eliminate the application of a reversing motor which has been found impractical for bench lathe work. The unit is running in one direction at all times and the reverse is obtained by a bevel gear with a gear mounted on either side. The shift is controlled by a clutch and the reverse is instantaneous, this action being necessary on light production tapping and similar work.

◆

Axle Housings Welded by Automatic Mechanism

Lincoln Electric Co., Cleveland, has designed a machine, shown in the accompanying illustration, for the manufacture of rear axle housings by the automatic carbon arc welding process. It consists of two automatic welding heads and clamps for holding the housings. The welding heads are driven across the seam to be welded and returned to the starting position by automatically controlled electric motors. A 400-ampere welder furnishes the current for each separate head.

As the housings come from presses, formed in two parts, they are placed in this machine to be welded. The jig which holds the housings is tilted down away from the welding heads toward the operator, while they are being inserted. The jig then is swung back into position and the two arcs struck simultaneously. The heads travel across the seam, in opposite directions, fusing the metal together as they go. At the extreme end of the housing the heads strike a limit switch which automatically interrupts the arc and returns the heads to the original position, ready to repeat the cycle. The housing is then turned through 180 degrees and placed into position for welding the reverse side.

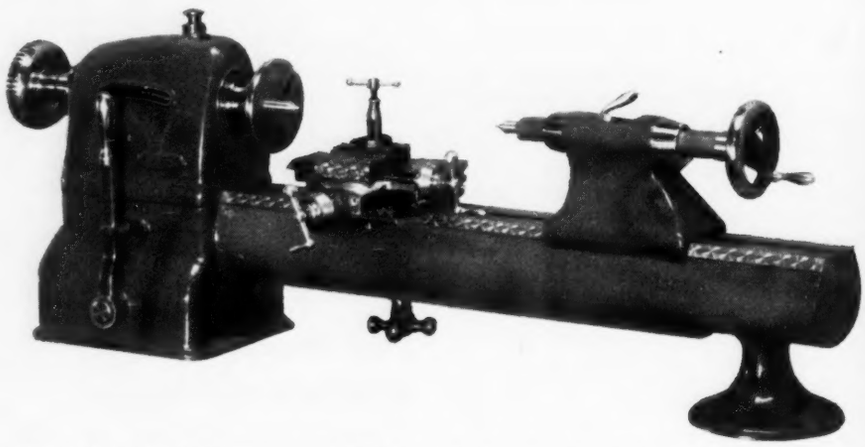
◆

Two-Pole Starting Switch Has Overload Relays

Cutler-Hammer Inc., Milwaukee, has developed a new two-pole, pushbutton operated starting switch with thermal overload relays for convenient starting and stopping of small direct-current and polyphase current motors. This new starting switch can be used with direct-current motors up to ½-horsepower, 115 volts; and ¼-horsepower, 230 volts, or with alternating current. Small in size, the switch can be mounted directly on the machine. For machinery builders, an open-type switch for building directly into the machine is offered.

Contacts Assure Long Life

Double-break, silver contacts and a quick break contact mechanism assure long life and continuous current carrying capacity. The thermal overload relays allow working the motor to the limit, yet disconnect it as soon as an overload becomes dangerous to the motor. When tripped by an overload, simply pushing the reset button resets the relay and starts the motor. The enclosed switch has conduit knockout holes in the top and bottom



Strength and rigidity are provided in redesigned motor-driven bench lathes and hand screw machines

for easy wiring. Arrangements are provided for sealing the cover if desired.

◆

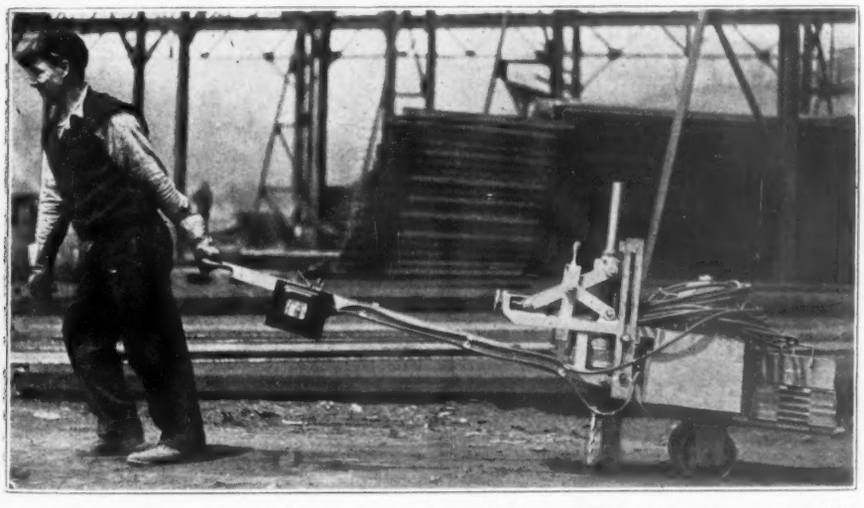
Toggle Controls Pressure on Portable Drill

Guibert Steel Co., Pittsburgh, has designed a revolutionary type of portable drilling machine having a wide range of uses. The machine, shown in the accompanying illustration, is powered by a 2-horsepower motor geared to a sliding spindle or toolholder in which the drill bit is held by a standard tapered socket. Cooling fluid is applied at the drill point from a tank mounted on the machine and is hand controlled. The pressure on the drill point is applied and controlled by means of a powerful toggle, and the machine is mounted on a buggy or carriage.

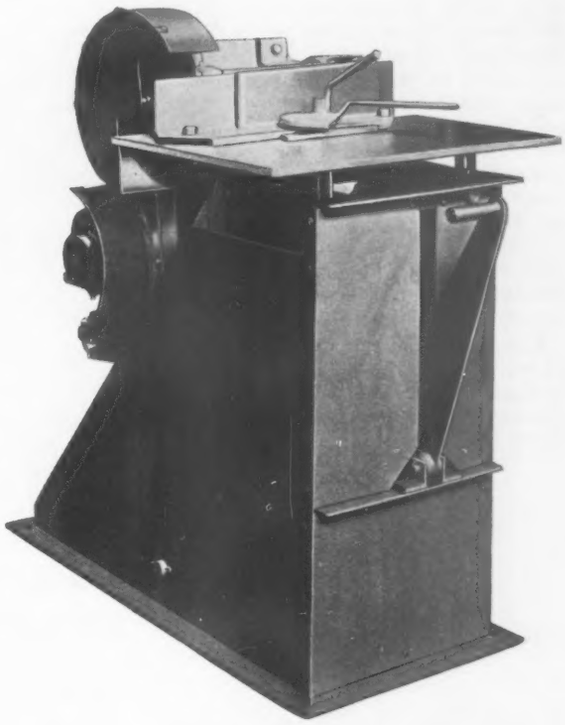
Machine Moved Easily

A simple system of weights and counterweights gives the machine the necessary weight required for drilling large holes and maintains balance so that the machine can be moved along with one hand, although the weight is approximately 1200 pounds. A rigid steel frame supports the motor and other parts, mounted on two steel rollers equipped with roller bearings. The operator leans or sits on the end of a 5-foot handle which is attached to the toggle, and by means of handwheels the stroke of the drill can be controlled from 1/64-inch up to full stroke which is 6 inches. A clutch on the spindle allows the toolholder to be raised or lowered as required. The handle is adjustable so that it can be arranged to suit either a tall or short workman. The frame, in addition to the rollers, rests on adjustable legs, which permits drilling a vertical hole in materials of different thickness, also to get close to the flanges in webs of large beams and H-sections.

An extension is supplied with each machine for lengthening the rollers so that they ride the edges of the flanges when it is necessary to drill in the webs of H-sections. A special attachment is also furnished for use in reaming chords of bridges. The machine is equipped with a hook and chain for transporting by crane, can be stripped of weights and counterweights and carried by three men, or it can be moved along on rollers.



A simple system of weights and counterweights maintains balance on portable drilling machine making it easy to transport



Rapid work may be performed on small cutoff saw

Small Cutoff Saw for Rapid Work on Light Sections

Joseph T. Ryerson & Sons Inc., Chicago, has designed a high-speed cutoff saw which is the smallest unit now offered by the company. The saw, shown in the accompanying illustration, is a small, light machine intended for cutting light-gage steel molding and small shapes of nonferrous material. Solid steel sections from ½ to ⅜-inch, round or square, can be cut with the regular toothed blade. Sections slightly larger can be cut with an abrasive disk .

The entire unit is built into a rugged frame made of welded structural steel with the blade mounted on an arbor carried by two heavy double-row self-aligning ball bearings. The arbor is driven by a triple V-belt and a 3-horsepower motor. A convenient quick operating clamp is provided for clamping any shapes while cutting, while a hand lever eccentric moves the rear barrier toward the front, holding the stock tight against the front barrier. The entire clamp may be set at any angle up to 45 degrees for miter cutting. Guards completely enclose the blade and the V-belt drive.

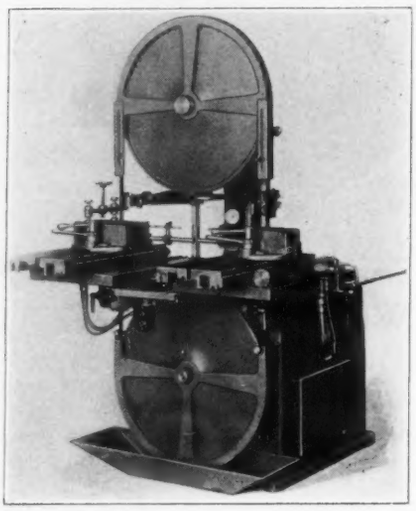
◆

Low-Pressure Hydraulic Feed on Bandsaws

William Laidlaw Inc., Belmont, N. Y., has designed a new low-pressure hydraulic feed for use in connection

with metal cutting bandsaws. The new feed consists of small rotary-type piston pump, oil reservoir, pressure regulating valve, relief valve, pressure gage, cylinder, piston, control valve and the necessary piping to conduct the oil from the reservoir through the pump and cylinders and back to the reservoir. The pump, reservoir, and all piping except the short flexible metallic hose connections to the cylinders are housed in the base of the machine, the pump coupled directly to the main driveshaft.

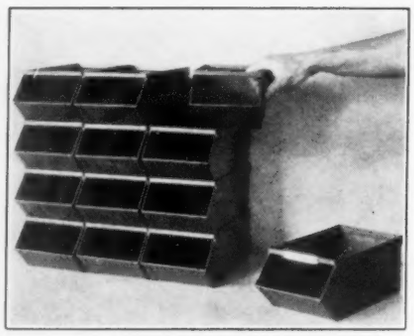
The stationary cylinders are mounted on top of the tables beside the movable carriage; the piston rod being connected directly to the latter. Between the brass lining of the cylinders



Metal cutting bandsaws have low-pressure hydraulic feed

and the side walls, a chamber is provided into which the oil is pumped from the reservoir through a ported rotary valve. This chamber is separated into two compartments by a ring cast in the inside of the cylinder and bored to fit the outside of the brass lining. The rotary control valve is located so that its center coincides with this dividing ring and oil can be admitted to either end of the cylinder. The oil is returned to the reservoir through an adjustable needle valve and this valve controls the speed at which the carriage is fed forward. The accompanying illustration shows a metal cutting bandsaw to which this new feed has been adapted.

The mechanism is so designed that when the control valve handle is moved to its extreme position the ports are brought to full opening. There is a positive stop attached to the front vise jaw which prevents the saw from cutting into the vise and when this stop comes into action the relief valve opens and permits the oil



Simplified handling of parts provided in new storage bins

to be returned to the reservoir when the pressure exceeds that at which the relief valve is set.

◆

Storage Bins Effect Savings in Handling Costs

Simplex Tool Co., Woonsocket, R. I., has devised an arrangement of nesting bins, shown in the accompanying illustration, which will reduce handling costs in a number of ways. The bins will save time in the assembling of small parts, reduce handling time on production work, and by eliminating counting in inventory work will save time in the stock room. The bins are constructed rigidly and are so designed that they will not unstack. Metal edges around the bin openings are bent over so that a smooth rounded edge is presented that will not catch the fingers of the operators.

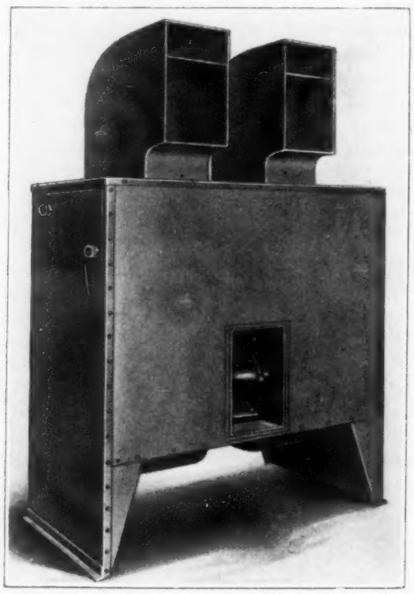
The bins reduce handling time as compared with the fixed type of bins as parts from final operations may be carried to the stock room and stacked in any order desired. They can be removed from stock in the same bins in which they are stored, and for inventory purposes eliminate the necessity of counting as parts can be weighed to get quantity. These bins provide an expanding and contracting stockroom or tool crib. They also permit easy access in the shop to a number of different parts without requiring an excessive amount of storage space. Three standard sizes are manufactured, 5½ by 10 inches, 4 inches high; 7½ by 12½ inches, 5½ inches high; and 9 by 15 inches, 6½ inches high.

◆

New System Confines Warm Air to Breathing Zone

Skinner Brother Mfg. Co., St. Louis, has developed a new method for the heating of large open space buildings which confines the heated air to the lower part of the structure. This method is an industrial heating process in which a blanket, or ceiling, of low temperature rapidly moving air is projected horizontally over the breathing zone of a building for the purpose of holding the warm air, issuing from special unit heaters, shown in the accompanying illustration, down in that zone. This enables the warmed air to give off its warmth without the usual loss of heat incident to the usual method of heating.

In most industrial buildings, the heat loss through the roof, skylights,



Unit heaters aid in keeping breathing zone warm

upper sash, and other parts of the building above the breathing line constitutes the greatest percentage of the total loss. The new process eliminates the necessity for first filling the space above the breathing zone with warmth, before the breathing zone itself can be properly warmed. This development is claimed to permit savings in industrial heating costs particularly in buildings with saw toothed roof construction, mill buildings or others which require a large, comparatively open roof area.

Officers for the year 1930-31 recently elected by the Cleveland chapter of the American Society for Steel Treating are as follows: Chairman, J. S. Ayling, sales manager, Case Hardening Service Co.; vice chairman, W. T. Donkin, metallurgist, Cleveland Wire Spring Co.; and secretary-treasurer, W. E. Benninghoff, industrial sales engineer, Cleveland Electric Illuminating Co.

Steel Uncertain About Last Half

Automotive and Railroad Slackness To Make July Light Month, but Rebound Is Expected—Pig Iron Rate Down in June—Some Steel Prices Softer

STEEL producers enter the third quarter with no illusions concerning the early part of it. Automotive requirements for steel are at the vanishing point, with Ford closing from July 11 to 28, Chevrolet down to a 3-day week, and most other makers curtailing. Railroad business on mill books is nil. While structural awards are moderately good and pipe output is excellent, these divisions of the industry merely continue June levels.

July, therefore, is a month which producers themselves concede the sooner past the better. Partially because this month threatens to dip so sharply, there is some opinion that a modest rebound will develop in August. For one thing, automotive manufacturers who are out of the market this month should be back next. Also, many consumers must replenish inventories soon.

But no great hopes are predicated on this rebound. In the frank spirit with which it now views the situation, the steel industry cannot vision a really virile market without a decisive comeback in buying by the railroads and the automotive industry. There is nothing now in the general situation to warrant expectations that a general recrudescence of buying power will materially quicken these major consumers of steel in the next few months.

While the trend of steelmaking operations continues downward, the true situation is obscured by July 4 shutdowns. Many finishing departments will be off all week, depressing this week's rate abnormally and resulting in a disproportionately higher one next week due to a probable accumulation of orders.

Steady deterioration in the steelmaking rate has more than its counterpart in pig iron. An estimate for June shows a net loss of 20 active stacks during the month, only 160 being active June 30. June's daily rate of 97,972 gross tons was 6.3 per cent below that of May. The June output of 2,939,172 gross tons gave the first half a total of 18,309,278 tons, a marked shrinkage from the 21,637,537 tons of 1929 but within distance of the 18,510,463 tons of 1928. Pig iron buying continues light. A 50-cent reduction was made at Cleveland this week.

Excepting structural steel, the markets for finished material are drab and unrelieved by noteworthy purchasing. Only the calendar evidences the turn of a quarter. Plates and shapes to most consumers are 1.70c, Pittsburgh, and bars 1.70c to 1.75c, but concessions have developed. Eastern mills now quote plates 1.75c, Coatesville, or 1.65c, Pittsburgh, whichever is lowest at destination. An important independent will meet 1.65c, but has not yet encountered it. Structural lettings have been heavy at New York, but fresh inquiry closes the ranks. In elevated roadways, bridges and subways over 125,000 tons continues active. At Chicago 12,000 tons is being figured, chiefly in bridges and utility projects. A high school there requires 5000 tons. Seattle is closing on 7500 tons for a bridge, the largest coast project this year. This week's structural awards, at 22,740 tons, bring 1930 lettings to date to 923,838 tons, against 1,153,347 tons a year ago.

Line pipe is active again, with the A. O. Smith Corp., Milwaukee, which is taking 200,000 tons of plates from Chicago mills during July and August, booking 100,000 tons of large diameter pipe for the Southern Natural Gas, United Gas and other companies. The proposed Standard Oil of New Jersey line from Texas may reach farther east than St. Louis, while the Sun Oil Co., recent buyer of 400 miles of gasoline line, contemplates additional work.

STEEL continues in identic form the composite market average developed and carried along for many years by Iron Trade Review. Weakness in pig iron, nails and bars lowers the average 10 cents this week, to $33.34.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (July 2, 1930)	$33.34
Last week (June 25, 1930)	33.44
One month ago (June, 1930)	33.53
Three months ago (April, 1930)	34.44
One year ago (July, 1929)	36.71
Ten years ago (July, 1920)	68.29

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	July 2, 1930	June, 1930	April, 1930	July, 1929
PIG IRON				
Bessemer, del. Pittsburgh	$20.76	20.76	20.76	20.76
Basic, valley	18.50	18.50	18.50	18.50
Basic, eastern del. eastern Pa.	18.76	18.75	18.76	19.85
No. 2 foundry, del. Pittsburgh	19.76	19.76	19.76	19.76
No. 2 foundry, Chicago	18.00	18.40	19.40	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.40
**No. 2X, Virginia Furnace	18.25	18.25	18.25	20.00
**No. 2X, Eastern del. Philadelphia	20.26	20.26	20.76	22.26
Malleable, valley	19.00	19.00	19.00	19.00
Malleable, Chicago	18.00	18.40	19.40	20.00
Lake Superior, charcoal, del. Chicago	27.04	24.04	27.04	27.04
Gray forge, del. Pittsburgh	19.13	19.13	19.13	19.13
Ferromanganese, del. Pittsburgh	103.79	103.79	103.79	109.79
*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12.00 to $13.00, Birmingham. **2.25 to 2.75 silicon.				
COKE				
Connellsville furnace, ovens	2.50	2.50	2.60	2.75
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	31.00	31.25	33.00	35.00
Sheet bars, open-hearth, Pittsburgh	31.00	31.25	33.00	35.00
Billets, open-hearth, Pittsburgh	31.00	31.25	33.00	35.00
Wire rods, Pittsburgh	36.00	36.00	38.00	42.00

	July 2, 1930	June, 1930	April, 1930	July, 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.70	1.75	1.80	1.95
Steel bars, Chicago	1.85	1.85	1.90	2.05
Steel bars, Philadelphia	2.04	2.04	2.12	2.27
Iron bars, Chicago	1.90	1.90	1.95	2.05
Shapes, Pittsburgh	1.70	1.70	1.80	1.95
Shapes, Philadelphia	1.76½	1.77	1.81	2.06
Shapes, Chicago	1.80	1.80	1.90	2.05
Tank plates, Pittsburgh	1.70	1.70	1.80	1.95
Tank plates, Philadelphia	1.85½	1.91	1.95	2.15
Tank plates, Chicago	1.80	1.80	1.90	2.05
Sheets, blue anl., No. 13, Pittsburgh	2.15	2.15	2.25	2.20
Sheets, black, No. 24, Pittsburgh	2.55	2.55	2.65	2.85
Sheets, gal., No. 24, Pittsburgh	3.15	3.20	3.30	3 60
Sheets, black, No. 24, Chicago	2.70	2.70	2.80	3.10
Sheets, blue anl., No. 13, Chicago	2.30	2.30	2.40	2.50
Sheets, galvanized, No. 24, Chicago	3.35	3.35	3.45	3.85
Plain wire, Pittsburgh	2.30	2.30	2.40	2.50
Wire nails, Pittsburgh	2.10	2.15	2.25	2.65
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pittsburgh	15.00	15.10	16.05	18.45
Heavy melting steel, eastern Pa.	12.50	13.25	13.95	16.50
Heavy melting steel, Chicago	12.00	12.05	13.00	14.75
No. 1 wrought, eastern Pa.	15.25	15.25	15.75	16.25
No. 1 wrought, Chicago	11.25	11.50	13.30	14.85
Rails for rolling, Chicago	14.50	14.55	15.00	17.50

Sheets

Quiet Period Set in—Valley Mills Work Overtime, Preparing to Suspend for Holidays

SHEET PRICES, PAGE 105

Youngstown, O.—While the larger users of sheets are buying sparingly others are taking a fair volume and they are specifying prompt shipment. Certain important sheet and strip makers in this district ran their mills through Saturday and Sunday to fill orders and now are down for the entire week. This enables the workmen to have a full week vacation, while mill managers are able to ship material to customers who are operating and demanding supplies. Fewer sheets are being taken this week by the automotive industry than last week, and makers are on lower schedules. Newton Steel is at 40 per cent, against 50 per cent last week. All plants of Empire Steel in the Niles district are down this week, and Thomas and Waddell plants also are idle. Mahoning Valley Steel is active, but Sharon Steel Hoop has curtailed. Both Republic and Sheet & Tube sheet mills are at about 50 per cent. Quotations continued generally unchanged at 2.55c, Pittsburgh, for common black; 2.00c to 2.15c for blue annealed; 3.15c for galvanized, and 3.70c for autobody.

New York—Galvanized sheets continue firm at 3.20c, Pittsburgh, to the manufacturing trade, with concessions down to 3.10c, to jobbers. Only the larger jobbers are receiving the minimum price. While there is occasional shading of $1 a ton on black sheets, the market is reasonably steady at 2.55c, Pittsburgh. Blue annealed plates and blue annealed sheets are holding at 2.00c and 2.15c, Pittsburgh, respectively. Sellers express a willingness to quote deliveries for the third quarter at these prices.

Pittsburgh—Sheet producers derive some encouragement from a slight increase in forward buying. Business still is slow and little improvement is looked for in the near future. Automotive business still is declining, with prospects poor for any upturn until the end of this month. Mill operations are holding at 50 to 55 per cent, although the holiday this week will curtail production. Prices are quotably unchanged, with black sheets usually 2.55c; blue annealed sheets 2.15c, and blue annealed plates 2.00c. Galvanized are quoted at 3.20c, but 3.15c is the more general market. Lower prices usually are applied only to jobbers.

Cleveland—Large users of sheets in the automotive field are on reduced operating schedules. A few shutting down for two weeks have held up shipments. Demand for furniture stock also is quiet. Prices are not strong. Black sheets are 2.45c, Pittsburgh; galvanized, 3.15c; blue annealed, 2.15c for No. 13, with continuous mills quoting as low as 1.95c; metal furniture and vitreous enameling, 3.70c; autobody, 3.60c, Pittsburgh.

Philadelphia—Sheet demand has picked up slightly. Prices are unchanged, with blue annealed firm at 2.00c and 2.15c, base, Pittsburgh, for heavy and light gages, respectively; black, 2.55c; and galvanized, 3.15c, with occasional concessions.

Chicago—Sheet mills are booking occasional orders for third quarter and are pinning hopes on some active galvanized roofing sales. Operations during June averaged 50 to 60 per cent. A year ago mills in this territory had backlogs for about 60 days. Producers do not feel that price reductions would bring out more business. Quotations are unchanged on the basis of 2.65c, mills, for No. 24 black; 3.30c for No. 24 galvanized; and 2.25c to 2.35c for No. 13, and 2.10c to 2.20c for No. 10 blue annealed.

One group of 28 hot mills is down entirely this week until Sunday night, bringing the average for sheet mill operations in this district to below 50 per cent.

St. Louis—Producers and distributors of sheets report no change in business compared with the past several weeks. There is a steady demand for small lots for prompt shipment, with the total each week making a moderately good showing. Prices are steady.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.45c to 2.55c
Detroit, delivered	2.76½c to 2.81½c
Philadelphia, delivered	2.84c
Gary, Indiana Harbor	2.65c
Chicago, delivered	2.70c
Birmingham, base	2.70c to 2.75c
St. Louis, del.	2.97c

TIN MILL BLACK NO. 28

Pittsburgh, base	2.80c to 2.90c
Gary, base	2.90c to 3.00c

GALVANIZED NO. 24

Pittsburgh, base	3.15c
Philadelphia, delivered	3.44c
Gary, Indiana Harbor	3.30c
Chicago, delivered	3.35c
Birmingham, base	3.40c
St. Louis, del.	3.62c

BLUE ANNEALFD SHEETS NO. 13

Pittsburgh, base*	1.95c to 2.15c
Chicago, district mills	2.25c to 2.35c
Chicago, delivered	2.30c to 2.40c
St. Louis, delivered	2.57c
Philadelphia, delivered	2.44c
Birmingham	2.35c

*Minimum price is for cont. mill.

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base*	1.80c to 2.00c
Chicago, district mills	2.10c to 2.20c
Chicago, delivered	2.15c to 2.25c
Philadelphia, delivered	2.29c
St. Louis, delivered	2.42c
Birmingham	2.20c

*Minimum price is for cont. mill.

AUTOMOBILE NO. 20

Pittsburgh, base	3.60c
Detroit, delivered	3.86½c

FURNITURE NO. 24

Pittsburgh	3.70c

Tin and Terne Plate

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	3.65c to 3.75c

*Price subject to quantity differentials.

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$2.10-2.15 and 2.25
Cement coated nails	2.15 and 2.25
Galvanized nails	4.15 and 4.25

(Per pound)

Polished staples	2.60c and 2.70c
Galvanized staples	2.85c and 2.95c
Barbed wire, gal.	2.80c and 2.90c
Annealed fence wire	2.30c and 2.40c
Galvanized wire	2.75c and 2.85c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Bright plain wire, 6 to 9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 per ton over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Steel Plates

Pittsburgh, base	1.70c
Philadelphia, del.	1.85½c
New York, del.	1.98c to 2.03c
Boston, del.	2.10c to 2.15c
Chicago, base	1.80c
Cleveland, delivered	1.88½c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.85c to 1.90c
Coatesville, Pa., base	1.75c
Pacific Coast, c.i.f.	2.25c
St. Louis del.	2.12c
Detroit, del.	1.96½c

Structural Shapes

Pittsburgh, base	1.70c
Philadelphia, del.	1.71½c to 1.76½c
New York, del.	1.90½c to 2.10½c
Boston, del.	2.03½c to 2.13½c
Chicago, base	1.80c
Cleveland, delivered	1.88½c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.85c to 1.90c
Pacific Coast, c.i.f.	2.35c
Detroit, del.	1.96½c

Bars

SOFT STEEL

Pittsburgh, base	1.70c to 1.75c
Chicago, base	1.85c
Birmingham, base	1.90c to 1.95c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.35c
Cleveland, base, local mills	1.75c to 1.80c
Cleveland, del, outside mills	1.82½c
Philadelphia, del.	1.99c to 2.04c
New York delivered	2.08c
Boston, delivered	2.15c
Detroit, del.	1.95c to 1.98½c
Pittsburgh, cold finish	1.90c
Pittsburgh, forg. qual.	2.00c

RAIL, STEEL

Chicago Heights	1.75c
Eastern mills	1.85c to 1.95c

IRON

Chicago, base	1.90c
New York, delivered	2.03c
Philadelphia, delivered	1.99c to 2.04c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh, billet cut lengths	2.00c to 2.05c
Stock lengths, mill	1.75c to 1.80c
Chi. billet, over 500 tons	1.85c
30 to 500 tons	2.00c
Under 30 tons	2.45c
Chicago, rail steel	1.65c to 1.70c
Road and bridge work	1.80c
Philadelphia, cut lengths	2.14c

Cold-Finished Steel

Bars, drawn or rolled, Pitts., Chi., Buff.	2.10c
Cleveland	2.00c to 2.10c
Do. delivered, Detroit	2.20c
Shafting (turned, polished) Pitts., Buffalo	2.10c
Shafting (turned, ground) mill	2.45c to 2.90c

(Depending on size, 1 3/16 to 7-inch)

Cut Nails

Carloads, f.o.b. mills	2.45c to 2.55c
Less-c.l., f.o.b. mills	2.55c to 2.65c

Chain

PROOF BB AND BBB, Pittsburgh

3/16 to ½-inch	33 1/3 and 5 off
9/16 to 1½-inch	33 1/3 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E. Series Number	Alloy differentials	Net 100 lb. bars
2000	0.25	$2.90
2100	0.55	3.20
2300	1.50	4.15
2500	2.25	4.90
3100	0.55	3.20
3200	1.35	4.00
3300	3.80	6.45
3400	3.20	5.85
4100 0.15-0.25 Mo.	0.50	3.15
4100 0.25-0.40 Mo	0.70	3.35
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.70
5100 0.60-0.90 Cr.	0.35	3.00
5100 0.80-1.10 Cr.	0.45	3.10
5100 Chr. spring.	0.20	2.85
6100 Bars	1.20	3.85
6100 Spring Steel	0.95	3.60
Chrome, Ni., Van.	1.50	4.15
Carbon Vanadium	0.95	3.60
9250 (flats)	0.25	2.90
9250 (rds., squrs.)	0.50	3.15

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets 35c; plates 31c; bars 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.75c to 1.80c
Delivered, Detroit	2.01½c
Hot strip 6 1/16 to 24-in., Pitts.	1.65c to 1.70c
Delivered, Detroit	1.91½c
Hot strip, bands 6 in. and under, Chicago	1.80c to 1.90c
Do. 6 1/16 to 24 in.	1.75c to 1.85c
Cooperage stocks, Pitts.	2.00c to 2.10c
Do. Chicago	2.10c to 2.20c
Cold rolled strip., Pitts., Cleve., 3 tons and over.	2.45c
Delivered, Detroit	2.65c
Worcester, Mass., (3 tons and over)	2.60c to 2.70c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Angle bars, Chicago base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes, boat and barge, Pittsburgh	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Track bolts, Pitts., stand. jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

Sheet Piling

Base, Pittsburgh	2.00c to 2.10c

Bars

Orders Small and Mills Operate at Low Rate—Buyers Resist Price, Which Is Weak

BAR PRICES, PAGE 105

Chicago—Bar tonnage offered is hardly sufficient to test prices or to keep mills operating above 65 per cent. A number of buyers resist 1.85c for bars in view of 1.80c for plates and shapes. Specifications and shipments average with the last four weeks. Deformed bar shipments are satisfactory. The implement outlook in uncertain, but some manufacturers are preparing for a good tillage tool run in the autumn. Road machinery and excavating equipment builders are taking fair shipments. Rail steel bar mills at Chicago Heights are maintaining 80 per cent operations.

New York—Eastern sellers of commercial bars continue to quote 1.75c, base, Pittsburgh. The situation generally is unsettled. Local sellers say they have not as yet encountered a reported price of 1.65c. Demand is quiet, with deliveries in two to three weeks.

Philadelphia—The market for steel bars is easier and 1.70c, base, Pittsburgh, has been done in a number of instances of specially desirable tonnages, particularly where shapes were included in the orders. The great majority of consumers, however, pay 1.75c. Specifications have fallen in the past week, though the total for June was not far below that of May.

Pittsburgh—Steel bar demand is well below the rate of a month ago, reflecting the decline in automotive requirements. A quiet market is in view during July with some prospects of improvement late in the month. The market generally is 1.75c, Pittsburgh, but 1.70c is becoming more prominent.

Youngstown, O.—Placing of new business for steel bars has been only fairly satisfactory to makers and mills continue to operate irregularly. Third quarter contracts have been taken at 1.75c, Pittsburgh, although competitive districts have developed a minimum of 1.70c for larger tonnages. No attention is being paid here to alleged quotations lower than the latter.

Steel Earnings Sensitive to Slow Market

Second quarter earnings statements of iron and steel producers, to come out shortly, are expected to reflect declining production and prices.

Sharon Steel Hoop Co., Sharon, Pa., has reduced its quarterly common dividend from 50 cents to 25 cents. Current assets May 31, after deducting reserves for inventory adjustments and accounts receivable, were $7,772,403, while current liabilities were $1,165,600.

Michigan Steel Corp., Detroit, is a bright spot, announcing earnings in five months sufficient to cover all 1930 dividends. Michigan Steel is increasing its capacity 30 per cent, financing through debentures.

Rustless Iron Corp. of America, Baltimore, for two months ended April 30 reports sales totaling $330,837, and net profits, after depreciation and before federal income taxes, of $50,052. Consolidated balance sheet of International Rustless Iron Corp. of America for Feb. 28, 1930, shows total assets of $8,750,043.

Get Second Look at Codes

Federal trade commission is cooperating more fully with industries before setting up codes of trade practice. Heretofore, after a trade practice conference, the resulting code was laid before the commission, which pruned and then promulgated it. Now, after the commission has changed a code, it is referred back to the interested industry for acceptance within 30 days.

The Golden Gate chapter, San Francisco, of the American Society for Steel Treating, recently elected the following officers for the year 1930-31: Chairman, Ivan L. Johnson, Best Steel Casting Co.; vice chairman, Myron Bird, California Saw Works; and secretary-treasurer R. S. Hirst, Hall-Scott Motor Car Co.

Plates

Good Demand Prevails in Middle West—Chicago Mills Active—Miscellaneous Orders Small

PLATE PRICES, PAGE 105

New York—A leading eastern platemaker has reduced its price $1 a ton to 1.75c, base, Coatesville, Pa., with no concessions to shipyards or railroads. It is believed other mills will take similar action. The following are plate bids opened today by the New York Central railroad: Otis Steel Co., 1.70c, base, Cleveland; Inland Steel Co., 1.80c, Indiana Harbor,Ind.; Bethlehem Steel Co., 1.80c West Seneca, N. Y.; Jones & Laughlin Steel Corp, 1.80c, West Seneca, and Jones & Laughlin, 1.70c, Youngstown, O.; Alan Wood Iron & Steel Co., 1.92c, Newbury Junction, Pa., Youngstown Sheet & Tube Co., 1.70c, Youngstown, O.; Carnegie Steel Co., 1.75c, Youngstown; Carnegie Steel Co., 1.85c, West Seneca; Illinois Steel Co., 1.80c, Chicago; Central Iron & Steel Co., 1.955c, Newbury Junction; Lukens Steel Co., 1.90c, Newbury Junction.

Bids are to be opened July 3 on three ships for the Colombian Steamship Lines, requiring 8000 to 10,000 tons of plates. Theodore Ferris, 30 Church street, New York, is in charge.

Philadelphia—Some eastern mills began today to quote plates at 1.75c, base, Coatesville, and 1.65c, base, Pittsburgh, depending on which is the more favorable at destination. This means a reduction of $1 a ton to a great majority of consumers as 95 per cent or more of them in this district have been paying 1.80c, Coatesville. Plate demand has fallen and mill operations now are 50 to 85 per cent of rolling capacity. Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has booked two vessels for the Eastern Steamship Co., Boston, each requiring 3300 tons of steel, mainly plates. The government will take bids Aug. 12 on an airplane carrier requiring 900 tons of steel, principally plates.

Pittsburgh—Plates remain quiet in the open market, although lap-welded pipe producers are large consumers. Fabricators are steady buyers but barge business continues dull. Buyers are paying 1.70c, Pittsburgh, on average tonnages, with lower prices restricted to attractive lots.

Birmingham, Ala.—Steady operation, though not at capacity, is noted at the new $2,000,000 universal plate mill of the Gulf States Steel Co. at Gadsden, Ala. A large force is pushing construction of the $2,500,000 sheet mill adjacent to the plate mill.

Cleveland.—Plate orders are small and pressure is brought on mill for prompt delivery. Occasionally 500 or 1000 tons are placed.

Local mills and several outside mills selling in this territory have not gone below 1.70c, Pittsburgh. Several carload orders for floor plates recently were received, including some for the new pipe plant of Republic Steel Corp., Youngstown, O. Total tonnage in this commodity for the first six months this year probably exceeds any like period in several years.

Chicago—Plate and structural mills are winding up shipments early this month to car shops on the final Chesapeake & Ohio car orders. Plates for oil tanks placed during the week totaled less than 1000 tons. One thousand tons additional have come out in inquiry for the southwestern oil country, making a total of about 15,000 tons of tank inquiry. Shipments of plates are proceeding by rail and water to Milwaukee on 200,000 to 250,000 tons of pipe line work. This will keep plate mills occupied at about 85 per cent for this month, and most of August. New tonnage is more active in structurals than in plates. Plate quotations are based on 1.80c, Chicago.

Contracts Placed

1000 tons, steel sheet piling, for Port Arthur, Tex., to Carnegie Steel Co.

Contracts Pending

3750 tons, water line for New York board of water supply. Patrick McGovern, New York, general contractor.

500 tons, pipe line for Salyer Consolidated Mining Co., San Francisco. Western Pipe & Steel Co., San Francisco, low bidder.

300 tons, caissons, Rutgers street tunnel, New York. Mason & Hangar, New York, general contractors.

Bolts, Nuts, Rivets Slow; Third Quarter Covered

Pittsburgh—Specifications for bolts, nuts and rivets remain slow and operations are lower at 50 per cent. Third quarter contracting practically is complete, with the market continuing 73 off for bolts and nuts, and 2.90c, Pittsburgh, for large rivets.

Cleveland—Nut, bolt and rivet orders are all for small lots. In most instances, less carloads are specified. Producers continue to feel the pinch of restricted automotive buying. Jobber purchases are slow. Quoted levels are unchanged. Operations average close to 45 or 50 per cent.

Chicago—Bolt, nut and rivet production remains at about 50 per cent. Third quarter contracting is completed with the usual commitments. Prices remain unchanged at 64 to 73 off for bolts and nuts, and 3.00c, Chicago, for structural rivets in carload lots.

Railroads

Car Backlogs Dwindle—Norfolk & Western to Build 500 Box Cars—Rails Quiet

RAILROAD TRACK PRICES, PAGE 105

New York—Placing of 500 cars by the Norfolk & Western with its own shops brings the total number of freight car awards in June to between 900 and 1000, according to preliminary estimates. This makes June one of the lightest months of the year but with Illinois Central probably closing on 2300 freight cars within two or three weeks and with one or two other fair-sized lists scheduled for early closing, July should be substantially heavier. Meanwhile, fresh car inquiry is slack and locomotive business continues the dullest in many months.

New York Central opened bids June 30 on last half plates, shapes, bars and other material. In contemplating requirements for six months, this railroad is departing from its usual custom of contracting for one quarter at a time.

Philadelphia—Pennsylvania will open bids July 9 on 19,000 pairs of angle bars and 100,000 tie plates.

Chicago—Rail mills operate 60 to 65 per cent, a decline of a few points. Miscellaneous rail tonnages closed amounted to only a few hundred tons. About 1000 tons of track fastenings were placed. Car shops are rapidly completing work on their orders.

Birmingham, Ala. — Bessemer works of Pullman Car & Mfg. Corp. within a few weeks will have worked out of its backlog. No additional business is in sight.

Car Orders Placed

Aluminum Co. of America, 45 hoppers, including 20 special type hoppers, to Canton Car Co., Canton, O.

Chicago & North Western, ten flats, to American Car & Foundry Co., Chicago.

Norfolk & Western, 500 all steel box cars, to its Roanoke, Va., shops.

RAILS PLACED

New York Board of Transportation, 2500 tons of rails, to Bethlehem Steel Co., Bethlehem, Pa.

Car Orders Pending

Bethlehem Steel Co., trucks for five ore cars.

Portland Cement Co., 20 side-door gondolas.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lists, apply to lists of May 10, 1930.

CARRIAGE BOLTS

All sizes, cut thread .....73 off
Rolled thread ¾ x 6 and smaller take 10 per cent lower list.
Eagle list .....73 off

MACHINE BOLTS

All sizes cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off
Tire bolts .....80, 10 and 10 off
Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 10, 5, 2½ off in bulk.
Rolled thread machine bolts, ¾ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished .....73 off

***HEXAGON CAP SCREWS**

Milled .....80-10-5 off
Upset 1 in. diam. and smaller 85-10 off

***SQUARE HEAD SET SCREWS**

Milled .....85-5 off
Upset 1 in. diam. and smaller .....80-10-5 off

*Discounts dated Jan. 23, 1930.

Rivets

Struc. c.l., Pitts.-Cleve. 2.90c
Structural, c.l., Chicago 3.00c
**7/16-inch and smaller, Pitts. .....70, 10 and 5 off
Chi., Cleve. .....70 to 70,10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Carloads, Pitts. dist.....$6.50 to $6.75 off
Carloads, Chicago dist..... 6.70 to 6.80 off
Less carloads, Chi. dist.... 6.50 to 6.75 off

Is Low on Wrought Chain

New York—American Chain Co. was low bidder on approximately 340 tons of open link, wrought iron buoy chain, ¾ to 1⅝ sizes and about 30 tons of buoy bridle chain for the United States light house service. Bids also are in for a tonnage of wrought iron connecting shackles for light ship chain, steel buoy shackles with split keys and shackles with riveted pins.

Signal Wire Is Awarded

New York—Copperweld Steel Co., Glassport, Pa., has been awarded the contract for 3,000,000 feet of wire for the signal office, army base, Brooklyn, N. Y., on whiih bids were opened several weeks ago.

What is now called the United States bureau of standards was established in 1901.

Structural Shapes

3000-ton Post Office at Brooklyn Tops Awards—Total Lower — Inquiries Mostly Engineering in Character—7500-ton Power Plant, Bridge Up

STRUCTURAL SHAPE PRICES, PAGE 105

New York—Structural steel lettings continue heavy, but new work coming out is still heavier. Most of the latter will be up for figures this summer. Bids are in on two subway sections, the latter 20,000 tons. A third section, 9400 tons, on which bids were taken in April, will be readvertised in August. The vehicular tunnel and main ramp, New York, approach to the Hudson river bridge, will take 4550 tons of shapes and 83,000 feet of 6-inch reinforcement trusses. Bids are due July 14. Engineering construction is ahead of last year, especially small bridge work and grade crossing elimination. The second Erie pier at Weehawken, pier D., still is pending. The Brooklyn post office addition, 3000 tons, was placed and Riverside Drive apartments, 700 tons, were let. More activity is noted in apartment building, slow since the first of the year.

Prices continue weak, but appear to have touched bottom. Strenuous efforts are being made to steady the price structure for the third quarter. Fabricating shops operate full in most instances with large order books. Smaller shops are taking more business, since buildings taking under 100 tons each are numerous.

Worcester, Mass.—Structural lettings are nearly negligible. A 450-ton high school here is pending.

Philadelphia—The usual price on plain standard shapes in this district is 1.70c to 1.75c, base, nearest mill, but 1.65c has become more frequent. Particularly attractive tonnages are going at even lower figures. Demand continues to maintain improvement over May.

Pittsburgh—Fabricated structural steel lacks the activity noted in the eastern market. Local awards and inquiries involve small lots. The market remains 1.70c, Pittsburgh, to most buyers, with lower prices generally applied to largest tonnages.

Cleveland—The closing week of June was quiet in structural awards. The 1300 tons for the administration building, board of education, is scheduled for letting this week. Action probably will also be taken on 4200 tons for the civic stadium, since this construction now is to be rushed. Plans for a $4,000,000 apartment are being prepared by Max Weis for Mornington drive and Euclid Heights boulevard, Cleveland Heights, O. Local sellers still quote 1.70c, Pittsburgh, although lower than that has been done on attractive tonnages.

Chicago—About 12,000 tons in fresh structural inquiry has appeared, largely bridge and utility work. In addition, Illinois highway department will ask bids shortly on 1500 tons of structural bridge work. The outlook is not favorable for commercial and residential building in Chicago for the remainder of the year. Structural mills operate about 65 per cent, with deliveries prompt to three weeks. Plain material is reported unchanged at 1.80c, base, Chicago.

Birmingham, Ala. — Structural awards have been few and far between. Fabricating shops are considering further retrenchment in operations. Several projects in sight a month ago appear still to be pending but with no definite prospects of being placed.

Contracts Placed

3000 tons, addition, Brooklyn postoffice and federal court building, to Taylor-Fichter Steel Construction Co., New York; Magoba Construction Co., general contractor.

3000 tons, apartment, East Fifty-second street, New York, to unstated fabricator.

2050 tons, 16-story apartment, East End avenue and Eighty-fifth street, New York, to American Bridge Co.

1600 tons, two 10-story apartments, 111-119 East Sixty-seventh street, and 112-120 East Sixty-eighth street, New York, tentatively awarded to Taylor-Fichter Steel Construction Co., New York; listed June 26 as going to unstated fabricator.

1500 tons, deck beams, Ridge avenue subway, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.; Joseph and Robert Lombardi, Philadelphia, general contractors.

800 tons, trestle, Rock Island, Columbia river, Wash., hydroelectric development by Stone & Webster Inc., to Isaacson Iron Works, Seattle.

700 tons, highway bridge at Chandlerville, Ill., to Clinton Bridge Works, Clinton, Iowa.

700 tons, two 6-story apartments, New Viaduct Building Corp., 769-777 Riverside drive and Riverside at West 158th street, New York, to Dreier Iron Works, New York; George G. Miller architect.

612 tons, bridge over Salinas river at Gonzales, Calif., to Moore Drydock Co., Oakland, Calif.

600 tons, South high school, Salt Lake City, Utah, to Salt Lake Engineering & Steel Corp., Salt Lake City.

500 tons, service building, Byllesby Engineering & Management Corp., Oklahoma City, Okla., to F. B. Klein Iron Works, Oklahoma City.

500 tons, power house, Calumet & Hecla Mining Co., Hubbell, Mich., to American Bridge Co.

450 tons, storage warehouse and conveyors. Alan Wood Mining Co., Wharton, N. J., to McClintic-Marshall Co.

400 tons, gymnasium and auditorium for St. Mary's academy, St. Francis, Wis., to C. Hennecke Co., Milwaukee.

400 tons, plant, Fairmont Railway Motors Inc., Fairmont, Minn., to Flint Structural Steel Co., Flint, Mich.

400 tons, bridges, Ouachita river, Felsenthal, Ark., to Decatur Iron & Steel Co., Decatur, Ala.; Gauger-Korsmo Construction Co., Memphis, Tenn., general contractor.

400 tons, bridge, Pennsylvania railroad in Pennsylvania, to Belmont Iron Works, Philadelphia.

400 tons, building, New York Shipbuilding Co., Camden, N. J., to Shoemaker Bridge Co., Pottstown, Pa.

390 tons, three fire stations, Staten Island, N. Y., to Kues Bros. Iron Works, Bronx, N. Y.; Castor & Castor Engineering Co., Brooklyn, N. Y., general contractor.

385 tons, United States postoffice and custom house, Memphis, Tenn., to Decatur Iron & Steel Co., Decatur, Ala.

350 tons, office building, Consumers Power Co., Pontiac, Mich., to Flint Structural Steel Co., Flint, Mich.

325 tons, highway bridge at Flietch, Wis., to Wausau Iron Works, Wausau, Wis.

300 tons, highway bridge in Maryland, to American Bridge Co.

300 tons, addition, St. Lawrence university, Canton, N. Y., to Kellogg Structural Steel Co., Buffalo.

300 tons, bridge, Pennsylvania railroad, Norwood, O., to American Bridge Co.

300 tons, 6-story bank, Hackensack, N. J., to American Bridge Co.; Ferber Construction Co., Hackensack, general contractor.

300 tons, bridge work, Chicago, Rock Island & Pacific railroad, to American Bridge Co.

300 tons, viaduct for St. Louis-San Francisco railroad at Tulsa, Okla., to Capital Iron Works Co., Topeka, Kans.

250 tons, highway bridge at Chesterville, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

Awards Compared

	Tons
Awards this week	22,740
Awards last week	41,304
Awards two weeks ago	33,413
Awards this week in 1929	39,844
Av. weekly awards, 1930	34,216
Av. weekly awards, 1929	42,213
Av. weekly awards, June	31,479
Tot. awards to date, 1929	1,153,347
Tot. awards to date, 1930	923,828

235 tons, mill and warehouse addition, Pacific Coast Steel Corp., Seattle, to Pacific Car & Foundry Co., Seattle.
230 tons, St. Margaret's school, Ninety-ninth and Throop streets, Chicago, to Midland Structural Steel Co., Chicago.
200 tons, extension to soaking pit building, Wisconsin Steel Co., South Chicago, Ill., to Worden-Allen Co., Chicago.
200 tons, 4-story office building, Third avenue and Eighty-fourth street, New York, to Kues Bros. Iron Works, New York.
200 tons, bridge over Trinity river at Hoopa, Calif., to Moore Drydock Co., Oakland, Calif.
200 tons, approaches to Aurora avenue bridge, King county hospital, and building United Bakery Co., all in Seattle, to Isaacton Iron Works, Seattle.
185 tons, plant addition, Pacific Coast Steel Corp., Seattle, to Isaacson Iron Works, Seattle.
150 tons, factory addition, Philadelphia Quartz Co., Berkeley, Calif., to Moore Drydock Co., Oakland, Calif.
138 tons, synagogue, Atlanta, Ga., to Decatur Iron & Steel Co., Decatur, Ala.; Griffin Construction Co., Atlanta, general contractor.
130 tons, bridge, Pennsylvania railroad, West Philadelphia, Pa., to Phoenix Bridge Co., Phoenixville, Pa.; Joseph A. Fuller Co., Philadelphia, general contractor.
125 tons, state highway bridge, Tuckahoe, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; Trieste & Earle, general contractor.
120 tons, business terminal and arcade structure at Knoxville, Tenn., to Ingalls Iron Works Co., Birmingham, Ala.
115 tons, steel truss bridge, Lowndes county, Mississippi, to Decatur Iron & Steel Co., Decatur, Ala.
100 tons, bank, Klamath Falls, Oreg., to Judson-Pacific Co., San Francisco.
100 tons, freight depot, Southern railway, Cincinnati, to Ingalls Iron Works Co., Pittsburgh.
100 tons, Catholic church at Cullman, Ala., to Ingalls Iron Works Co., Birmingham, Ala.
100 tons, 3-story offices and stores, Livingston street, New York, to Dreier Iron Works, New York.
100 tons, bridge for Vallejo, Calif., to Moore Drydock Co., Oakland, Calif.
100 tons or more, store building, West Grand boulevard and Grand River avenue, Detroit, to R. C. Mahon Co., Detroit.

Contracts Pending

9400 tons, subway, route 108, section 6, Queens, N. Y.; bids taken in April rejected, to be readvertised in August.
7500 tons, addition to power house of State Line Generating Co., Hammond, Ind.
7500 tons, Aurora avenue bridge, Seattle; United States Steel Products Co., San Francisco, low bidder.
5000 tons, Lane Technical high school, Chicago; being readvertised by Chicago board of education.
4550 tons, vehicular tunnel and main approach ramp, Hudson river bridge, New York side; also 83,000 feet reinforcement trusses six inches deep in ramp contract; bids to be taken by Port of New York Authority July 14 (two contracts).
4400 tons, plant, Ford Motor Co., Richmond, Calif.; bids received.
3500 tons, office building, Madison avenue and Fortieth street, New York.
1000 tons, additional bridges in New York state.
800 tons, building, Swedish Engineering society, Chicago.
750 tons, highway bridge over Indiana Harbor Belt Line railroad, Chicago.
550 tons, state highway bridges in Oklahoma.
500 tons, $1,125,000 high school, Onaway oval, Shaker Heights, O.; bids July 19.
500 tons, bridgework for Chicago & Western Indiana railroad, at Chicago.
400 tons, highway bridges in Massachusetts.
400 tons, sanitarium, Green avenue, Brooklyn, N. Y.
357 tons, auxiliary steam power plant, Tacoma, Wash.; bids in.
200 tons, school, Salt Lake City, Utah; bids being taken.
175 tons, National Guard hangar, St. Louis airport, St. Louis.
170 tons, building, Ohio Wesleyan university, Delaware, O.
168 tons, state bridge over Trinity river, Trinity county, Calif.; bids July 9.
165 tons, J. R. Buchtel high school, Akron, O.
150 tons, warehouse, Brooklyn, N. Y.
150 tons, bridge over Carver creek, Oregon; bids in.
150 tons, addition, Cleveland Heights, O., high school; general contract to Charles Peterson Construction Co., Cleveland.
140 tons, Geneva General hospital, Geneva, N. Y.; Harrison Engineering Co., Buffalo, general contractor.
135 tons, overhead crossing, Nevada county, Calif.; bids opened.
129 tons, physics laboratory, Harvard university, Cambridge, Mass.
105 tons, plant addition, Norma-Hoffman Bearing Corp., Stamford, Conn.; general contract to the Hewlett Co., Bridgeport, Conn.
100 tons, branch bank, Guardian Trust Co., Pearl road, Cleveland, general contract to George L. Craig Inc., Cleveland; plans not yet complete.
100 tons, bridge, Boston & Maine railroad, Denbury, N. H.
100 tons, hotel, Emeryville, Calif.; Judson-Pacific Co., San Francisco, low bidder.
Unstated tonnage, $2,000,000 General hospital, Buffalo; W. J. and F. J. Kidd, Buffalo, architects; plans being prepared.

Concrete Bars

900-ton Sears, Roebuck Store Let in New York—2500-ton Ford Plant Up in California—1000-ton Tunnel Pending in East—Inquiries, Lettings Fewer—

REINFORCING BAR PRICES, PAGE 105

Chicago—Additional road work and a number of small building awards make an imposing total reinforcing bar tonnage. Deformed bar shipments from mills are practically up to a year ago. About 600 tons has been placed for the medical and dental laboratory, University of Illinois. Billet bar fabricators quote 1.85c for 500 tons or more, and 2.00c for carloads to 500 tons.

Boston—From 500 to 600 tons of concrete bars were sold in this section last week. About 200 tons of this was in small lots and several lettings involved 100 to 125 tons.

Awards Compared

	Tons
Awards this week	4,753
Awards last week	6,162
Awards two weeks ago	10,525
Awards this week in 1929	6,971
Average weekly awards, 1929	5,849
Average weekly awards, 1930	7,053
Average weekly awards, June	7,338
Total awards to date, 1929	175,723
Total awards to date, 1930	190,434

New York—Concrete reinforcing bars are fairly active, with considerable volume still pending. Bids are in on a large tonnage of bars and mesh for upstate county highway work. The Hudson river approach ramp and tunnel will take 1000 tons of bars and 60 tons of mesh. New Jersey roadwork, 525 tons, was placed, much of it going rail steel. Prices are mixed. Only on small tonnages does 2.55c, New York, prevail.

Buffalo—A fair third quarter is in prospect for producers of reinforcing bars. Considerable late season roadwork awards are noted.

Philadelphia—Concrete reinforcing bars for mill shipment continue 1.85c, Pittsburgh, for cut lengths, and 1.75c to 1.80, Pittsburgh, for stock.

Pittsburgh—No change is noted in concrete bar tonnage with business holding at a good seasonal rate. Prospective work points to well sustained activity for a number of weeks.

Cleveland—Inquiries for concrete bars for jobs taking 100 to 1000 tons at a time are a trifle more numerous. Bridge piers lead, 1000 tons being up, through Lowensohn Construction Co. The administration building for

Cleveland's board of education will take 250 tons.

Contracts Placed

900 tons, 16-story building, Sears, Roebuck & Co., Ninth avenue and Thirty-first street, New York, to Jones & Laughlin Steel Corp., Pittsburgh, through Turner Construction Co., New York, general contractor.

650 tons, medical and dental laboratory, University of Illinois, Chicago, to Concrete Steel Co., Chicago.

450 tons, office and plant, Seattle Times Co., Seattle, to Northwest Steel Rolling Mills, Seattle.

450 tons, industrial building, Washington, Cedar and Albany streets, New York, to Concrete Steel Co., New York; Industrial Engineering Co., general contractor.

375 tons, highway route 34, three sections, Monmouth county, New Jersey, to Joseph T. Ryerson & Son Inc., Newark, N. J.

375 tons, pedestrian concourse, City Hall, Philadelphia, to Concrete Steel Co., Philadelphia, through Keystone State Construction Co., Philadelphia, general contractor.

350 tons, pier F, Pennsylvania railroad, Jersey City, N. J., to Igoe Bros., Newark, N. J.; J. Rich Steers Inc., general contractor.

193 tons, for city of Los Angeles, to Blue Diamond Co., Los Angeles.

175 tons, candy factory, Cambridge, Mass., to Joseph T. Ryerson & Son Inc.

150 tons, highway route 39, section 9, New Jersey, to Joseph T. Ryerson & Son Inc., Newark, N. J.

150 tons, Illinois road work, to Concrete Engineering Co., Chicago.

125 tons, Psychopathic hospital, First avenue and Twenty-ninth street, New York, to Kallman Steel Co., New York; R. E. Smith Co., general contractor.

110 tons, Beaconsfield garage, Brookline, Mass., to Concrete Steel Co.

100 tons, highway work, Washington, to Northwest Steel Rolling Mills, Seattle.

100 tons, apartment house, Boston, to Kalman Steel Co.

100 tons, property building, R. K. O. studios, Los Angeles, to Concrete Engineering Co., Los Angeles.

Contracts Pending

2500 tons, plant, Ford Motor Co., Richmond, Calif.; bids opened.

800 tons, main approach ramp, Hudson river bridge, New York side; bids to be taken by Port Authority of New York, July 14.

415 tons, Washington street bridge, Los Angeles; bids received.

315 tons, highway work in San Diego county, Calif.; bids received.

300 tons, additional, Brooklyn, N. Y., post office.

200 tons, also 60 tons of mesh, vehicular tunnel, West 178th street, New York, section of approach to Hudson river bridge; bids to be taken by Port Authority of New York, July 14.

180 tons (mesh), for Monroe-Livingston, N. Y., highway, general contract to F. W. Crouch, Rochester, N. Y.

150 tons, Big Four railroad bridge, West Fifty-third street, Cleveland, to cost $350,000; general contract to Freeman & Jones, Cleveland.

103 tons, sewer in Reno, Nev.; bids received.

100 tons, sewage disposal plant, Charlottesville, Va.; bids in.

Strip

Summer Dullness Cuts Into Mill Orders—Third Quarter Coverage Well Under Way

STRIP PRICES, PAGE 105

Pittsburgh—Strip steel business continues to moderate. Producers believe the low level of the summer is at hand. Shipments to those companies which close their plants during July are tapering and new releases for resumption of operations are not expected for a number of weeks. Third quarter contracting is fairly heavy, with 1.65c and 1.75c generally the minimums on hot strip. Producers are asking 1.70c and 1.80c on smaller tonnages and some business at these figures has been placed. Cold strip usually is 2.45c, with only occasional reports of business at less. Mill opertions are off further with the current average 45 to 55 per cent for hot and 25 to 35 per cent for cold strip.

New York—Hot strip prices now are on the basis of 1.65c to 1.70c Pittsburgh, for wide and 1.75c to 1.80c for narrow, with cold-rolled strip at a flat level of 2.45c, Pittsburgh. Easier prices have done little in stimulating demand, which in all products is exceedingly slack.

Philadelphia—Hot strip is somewhat easier at 1.65c to 1.75c or 1.80c for widths over six to 24 inches. Occasional further concessions are made on especially desirable tonnages. Cold-rolled strip continues 2.45c, Pittsburgh, without much movement to test the price.

Cleveland—Although most strip steel users have signed third quarter contracts, specifications have been negligible. Automotive consumption is low and in other lines is satisfied by small lots. Cold strip operation is below 50 per cent and hot strip about that level. Cold strip is quoted 2.45c, Cleveland, and hot 1.65c, Pittsburgh, on wide and 1.75c, Pittsburgh, on narrow.

Chicago—Hot-rolled strip mills are operating at about 50 per cent. Attractive tonnages bring 1.75c for wide material, and 1.80c, Chicago, for narrower hot strips. Cold-rolled mills have no backlogs and buyers are showing little interest in third quarter.

Tin Plate Demand Is Less Active Than in June

TIN PLATE PRICES, PAGE 105

Pittsburgh—Tin plate specifications show their uusal seasonal decline, with operations varying accordingly. Some mills will be closed this week, taking advantage of the holiday interruption, and the average for the district is 70 to 75 per cent. June shipments were heavy but July tonnage is not expected to equal last month's volume. Tin plate remains $5.25 per base box.

Youngstown, O.—To the surprise of tin plate makers inactivity in the market shows no immediate signs of passing. This is the season when canners take good tonnages. Mill managers are puzzled at the lack of business from that source. So far as can be learned, makers have not yet named the second half price. Current sales are at $5.25, Pittsburgh, per base box.

Cold Finished Prospects Dull; Price Untested

COLD FINISHED PRICES, PAGE 105

Pittsburgh—Cold-finished bar demand continues slow. Specifications of automotive interests have been reduced considerably since June 1 and only a moderate further decline is looked for during July. Third-quarter contracting is fairly well completed, with the market continuing 2.10c, Pittsburgh, despite recent weakness in hot bars.

Cleveland.—Judging from specifications in hand or in prospect July will be even more quiet than was June in cold finished bars. Automotive consumption is in for further shrinkage due to vacation shutdowns, and curtailed output from other causes. The 2.10c, Cleveland, price prevails but largely is untested. Consumption outside and even in automotive circles calls for numerous small orders, but these in the aggregate do not support operations above 40 to 50 per cent.

Iron Ore Shipments 29 Per Cent Under Last Year

IRON ORE PRICES, PAGE 116

Cleveland—Consumers of Lake Superior iron ore continue to scale down requirements. The vessel movement in June was 8,520,000 tons, with the last three days esti-

mated. This is an increase of 1,540,787 tons over May, but much less than customary. The June shipment was about 10.6 per cent less than that in June, 1929. Shipments this year to July 1 total 15,607,132 tons, or 29 per cent less than in the comparable period last year. At this rate shipments for the season will be slightly less than 50,000,000 tons. The current market is quiet, sellers noting an absence of inquiries for small or large lots.

Scrap Men Ask Institute To Condemn Direct Buying

Condemnation by the American Iron and Steel institute, New York, of direct purchasing of iron and steel scrap by steelmakers is asked in a brief filed by the Institute of Scrap Iron and Steel with the special committee of the steel institute, composed of James A. Farrell, E. G. Grace and L. E. Block, appointed to confer on scrap problems. The brief calls the practice uneconomic and opposed to the best interests of the steel industry.

It is also requested that the American Iron and Steel institute authorize a scrap marketing survey, the first in the history of the industry, with the co-operation of the Institute of Scrap Iron and Steel, to improving the machinery for marketing, distribution, and full utilization of scrap. Special emphasis is laid on conservation of national resources and the services of scrap iron dealers during the last 25 years in developing their business to keep pace with the unprecedented demands of the steel industry for scrap. The effect of the purchasing of unprepared scrap by mills, as a chief source of supply, on the scrap iron industry and on the steel mills, is also covered in the brief.

Unfair competition among dealers in iron and steel scrap in the Cincinnati district is believed to result from inadequate knowledge of costs of preparing scrap. To eliminate this the Cincinnati chapter of the Institute of Scrap Iron and Steel is considering employing an expert to study elements of cost, prepare a manual and instruct in establishing cost systems.

The Philadelphia chapter of the American Society for Steel Treating recently elected the following officers for 1930-31: Chairman, Gustaf Peterson, sales manager, Ludlum Steel Co.; vice chairman, Dr. Henry C. Boynton, metallurgist, John A. Roebling's Sons Co.; and secretary-treasurer, A. O. Schaefer, assistant engineer of tests, Midvale Co.

Pipe

New York Boroughs Want Cast —Lido, N. J., Rejects Bids— More Line Pipe Is in Sight

PIPE PRICES, PAGE 129

Pittsburgh—Reports continue of additional pipe line projects, some involving substantial tonnages. The line of the Standard Oil Co. of New Jersey originally reported planned from Texas to St. Louis is understood to involve a further extension east although announcement of the awarding of this line is lacking. Sun Oil Co. is understood in the market for a substantial tonnage. This company placed 400 miles of pipe a number of weeks ago for a line through Pennsylvania. Mills continue well engaged against old line pipe orders and work is being pushed on new facilities being installed by several companies. Standard pipe is marking time with little additional improvement noted. Demand for oil country goods still is spotty. Mill operations hold around 75 per cent.

New York—New York boroughs are more active for cast iron pipe requirements, 1650 tons being pending on two contracts. About 350 tons was placed. A large tonnage, third quarter requirements, of hydraulic parts for the department of water supply, gas and electricity has been awarded A. P. Smith Mfg. Co., East Orange, N. J. Bids on 2400 tons of 24-inch cast pipe for Lido, N. J., were rejected. Prices are firm at $37, eastern and Birmingham foundry. Subways continue to take a fair pipe and fitting tonnage. Small lots are fairly active. Pending volume is lower following the letting of two large contracts last week.

Cleveland—Stock orders from pipe jobbers are occasionally received by northern Ohio mills. Many of these are mixed carloads of buttweld; some involve a carload of a size. East Ohio Gas Co. and other utility interests buy lapweld or seamless from time to time as needed. Buttweld operations average 50 per cent or less; lapweld 85 per cent or more.

Chicago.—Saginaw, Mich., took bids July 1 on 130 tons of 6, 16 and 24-inch cast and processed pipe. Chicago Heights, Ill., has placed orders for 2000 tons. Chicago board of public works placed 500 tons and fair buying is reported in Ohio. Advertised work in Illinois, Wisconsin, Indiana and Iowa is extremely light. Prices are nominal for municipal work.

A. O. Smith Corp. booked 100,000 tons of large diameter gasoline pipe in several orders for the Southern Natural Gas Corp., United Gas Co., and others.

Birmingham, Ala.—A few cast pipe lettings were recently reported and production is being maintained at a fairly steady pace, although nothing like a few months ago. Far-west shipments are steady. Quotations are unchanged, $37 to $38 on 6-inch and larger.

Contracts Placed

2000 tons, 6 to 16-inch cast pipe for Chicago Heights, Ill., to unstated foundry; George A. Fuller Construction Co., Chicago, general contractor.

645 tons, 8 and 12-inch class 150, cast pipe, to United States Pipe & Foundry Co.

500 tons, 4 and 16-inch cast pipe for Chicago, to Glamorgan Pipe & Foundry Co., Lynchburg, Va.

350 tons, 30-inch cast iron pipe for Queens, N. Y., to United States Pipe & Foundry Co., East Burlington, N. J.

328 tons, 10 and 12-inch cast pipe, for Olympia, Wash., to Pacific States Cast Iron Co., Portland, Oreg., accessories to United States Pipe & Foundry Co.

150 tons, mostly 12-inch cast pipe for Ossining, N. Y., to R. D. Wood & Co., Florence, N. J.

133 tons, 4 to 12-inch class B cast pipe, improvement of Industrial avenue, Long Beach, Calif., to D. P. Durham.

STEEL PIPE PLACED

100,000 tons, large diameter gasoline pipe, several orders from Southern Natural Gas Corp., United Gas Co., and others, to A. O. Smith Corp.

Contracts Pending

2400 tons, 24-inch cast sewer pipe for Lido, N. J.; bids rejected.

900 tons, 12 to 30-inch cast pipe for Bronx, N. Y.; bids in, Melrose Construction Co. low on general contract.

829 tons, 10, 12 and 16-inch cast pipe, Olympia, Wash.; readvertised for bids July 3.

750 tons, 12 to 24-inch cast pipe for Richmond, N. Y.; bids in.

657 tons, 6 and 8-inch class B, cast pipe improvement of Manchester avenue, Los Angeles; bids received.

537 tons, 6-inch class C for Vancouver, B. C.; bids July 7.

130 tons, 6, 16 and 24-inch cast pipe for Saginaw, Mich.; bids July 1.

100 tons, 6 to 15-inch cast pipe for sewage disposal plant, Charlottesville, Va.; bids in.

Officers for the year 1930-31 which were recently elected by the Montreal, Que., chapter of the American Society for Steel Treating are as follows: Honorary chairman, Dr. Alfred Stans-

Full-Finished SHEETS

For—Automobile Bodies, Metal Furniture, Stampings—deep drawing and extra deep drawing qualities.

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BUFFALO.....Marine Trust Bldg.	NEW ORLEANS.....437 Decatur St.
CHICAGO.....180 N. Michigan Ave.	NEW YORK.....1372 Hudson Term. Bldg.
CLEVELAND.....1655 Union Trust Bldg.	PHILADELPHIA.....607 Otis Bldg.
CINCINNATI.....1002 American Bldg.	SAN FRANCISCO.....Monadnock Bldg.
DETROIT.....2034 Dime Bank Bldg.	ST. LOUIS.....2817 Laclede Ave.
INDIANAPOLIS.....508 Illinois Bldg.	SYRACUSE.....Hills Bldg.
LOS ANGELES.....Orpheum Bldg.	SEATTLE.....L. C. Smith Bldg.

field, McGill university; chairman, T. C. McConkey, vice president, E. J. Coughlin Co. Ltd.; vice chairman, Robert J. Noakes, Canadian Pneumatic Tool Co.; secretary, William Baxter; and treasurer, Duncan MacInnes.

Operations Again Decline, with Cleveland Low

Chicago—Finishing mill and ingot production is at 65 to 75 per cent. The leading interest has 13 of 27 steelworks furnaces blowing having banked its No. 12 furnace at Gary, Ind., until after July 4. Rail mill operations are slightly off at about 60 to 65 per cent. A year ago operations showed their first signs of slowing down in this district, the rate dropping to below 95 per cent after several months of capacity output.

Pittsburgh—Steelmaking holds at 65 per cent. Finishing mill operations are lower, with tin plate at 70 to 75, and strip at 45 to 55. Sheet output continues 50 to 55, with pipe steady at 75. Finishing mill operations during this week will be reduced due to the holiday.

Buffalo—Declines in open-hearth operations, continuous over the past ten days, find 18 to 37 steelworks furnaces producing at a 48 per cent ratio. Little hope is held for an early restoration to second quarter levels which have held at 70 to 75 per cent. General decline in orders has been responsible for curtailment.

Birmingham, Ala.—Steel operations in both open-hearth furnaces and finishing mills are under 65 per cent. Fabricating shops are operating around 70 per cent capacity.

Youngstown, O.—Mill operations will be further affected by the observance of July 4. Most of the plants with the exception of coke works and blast furnaces will end operations Thursday. General average output for the district will be less than 50 per cent. Only 25 of the 51 open-hearth furnaces owned by independents are in operation with Bessemer output still at a 60 per cent rate. Corporation steel plants are operating between 55 and 60 per cent.

Cleveland—Steelmaking is about 30 per cent with only ten of the district's 34 open-hearth furnaces on, reveals a further slump from last week. Approaching week-end holidays are in part attributable. Otis Steel Co. has closed all eight open hearths for a week; Corrigan McKinney Steel Co. continues with five of 14 active.

Wire

Low Point in Demand Brings Price Concessions — Nails Are Weakest of Wire Products

WIRE PRICES, PAGE 105

Chicago—Western wire mills are able to maintain 40 to 50 per cent operations. Further recession is following the recent mild spurt in manufacturers' wire orders. Concessions are reported in wire prices, but quotations are on the basis of 2.35c, Chicago or western mills, for bright plain wire, and 2.35c to 2.45c for annealed fence wire. Jobber prices of wire nails are weak but, according to reports in this market, $2.10, base Pittsburgh-Cleveland, has been made as a result of equalization of river freight rates in other districts. Recent contracts have been signed on the basis of $2.15, Pittsburgh-Cleveland.

Worcester, Mass.—June shipments of wire touched the low mark for this year and are greatly under last year's mark. Demand for tire wire and wire for building purposes has fallen off sharply.

New York—Notwithstanding reports of $2.05, Pittsburgh, on nails, most business here is going at $2.10 to $2.15. At least one leading seller reports that he is doing nothing under $2.10 and that in relatively few cases. Another is quoting $2.10 more freely but only as an absolute minimum at this time. The trend of nails continues easy, with most business in small quantities. Plain wire, however, is firm at 2.30c, Pittsburgh.

Pittsburgh—Sales of jobbers' and manufacturers' wire products containue dull. Producers believe the decline in automotive requirements for wire is approaching bottom. Unsettlement exists in the wire nail market, with $2.10 more prominent on new business. Some third quarter tonnage, however, has been booked at $2.15. Plain wire usually is 2.30c.

Cleveland—Despite occasional lower prices on large lots of wire nails, made elsewhere, producers here continue to receive specifications against $2.15, Cleveland contracts. Some jobbers occasionally order attractive quantities for stock. Curtailed operations on the part of large wire users such as nut, bolt, rivet and screw manufacturers results in lowered shipping instructions to wire and wire rod mills. These are confined to small lots as needed. The 2.30c, Cleveland, price is quoted.

Youngstown, O.—Makers of wire products here point out that their books are filled with third quarter specifications at $2.15 a keg for wire nails, which they now claim is below actual cost of manufacture and packing. They are determined to continue to make deliveries on the basis of $2.15 a keg and refuse to scale down contracts. They hold plain bright wire at 2.30c firmly.

Philadelphia—Wire nails here range from $2.10 to $2.15, with occasional sales at $2.05.

Warehouse Volumes Small; New York Prices Cut

WAREHOUSE PRICES, PAGE 129

New York—Local jobber market is being brought more in line with the mill situation in establishment of a new quantity base on bands, hoops, bars, shapes, blue annealed sheets and plates, base applying to lots of 400 to 3999 pounds. New prices range from $3 to $10 a ton under previous quotations.

Philadelphia—Jobbers report a slight improvement in general business. Jobbers are quoting 3.30c, base, delivered locally, on bright and galvanized wire; 3.55c on tinned and coppered wire. Other prices are firm and unchanged.

Pittsburgh—Demand remains fairly slow although only a moderate decline in June tonnage is shown from that of May. Official quotations are unchanged despite some shading.

Cleveland — Preliminary reports from the iron and steel warehouses place June business on a slightly lower level than May 1.

Cincinnati—Warehouse prices are unchanged with dull demand revealed chiefly in smaller individual orders.

St. Louis—The week has witnessed moderate improvement in demand, which has been confined, however, to some wire products. Highway construction items are active, though building materials continue slow. Railroad purchasing has been cut to the bone.

Chicago—Expected heavier warehouse demand in June failed to materialize and the month had about the same total as May. Prices are steady except for wire products, including nails.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY NO. 2

Chicago, furnace	$18.00
Chicago, lake dock	17.00 to 18.00
Pittsburgh, district fur.	19.00
Pittsburgh, delivered	19.13 to 20.13
Valley, furnace	18.00 to 18.50
Cleveland fur., local del.	18.00
Philadelphia, delivered	19.76
Virginia, furnace	17.75
Granite City, Ill., fur.	18.50 to 19.00
Buffalo, fur., local del.	18.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail Brooklyn	20.91 to 21.41
Buff., all-rail, Newark	19.28 to 19.78
Ala., Bir. fur., local del.	14.00
Alabama, del. Chicago	18.01
Alabama, del. St. Louis	17.42
Alabama, del. Cincinnati	16.69 to 18.19
Alabama, del. Cleveland	18.51 to 19.01
Ala., Phila., dock del.	17.25 to 18.25
Ala., Balt., dock del.	17.00 to 18.00
Alabama, New York dock	18.00 to 18.50
Ala., Boston dock del.	20.21
Tenn., Bir. base, local del	14.00
Tennessee, del. Cin.	16.69 to 18.19
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	19.00
Buff., all-rail, Brooklyn	21.41 to 21.91
Buffalo, all-rail, Newark	19.78 to 20.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del., Phila.	20.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	20.00
Eastern, del., Phila.	20.76

MALLEABLE

Chicago, furnace	18.00
Chicago, lake dock	17.00 to 18.00
Cleveland fur., local del.	18.00
Pittsburgh district fur.	19.50
Pittsburgh, delivered	19.63 to 20.63
Valley furnace	18.50 to 19.00
Buffalo fur., local del.	19.00
Eastern Penn., delivered	19.76 to 21.41
Granite City, Ill., fur.	18.50 to 19.00
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	19.00
Pittsburgh, delivered	19.13 to 20.13
Eastern Penn., del.	18.50 to 19.00
Buffalo fur., local del.	18.00
Montreal, delivered	22.50
Valley furnace	18.00 to 18.50

BESSEMER

Valley, furnace	18.50 to 19.00
Pittsburgh, delivered	20.26 to 20.76

LOW PHOS

Valley fur., standard	27.00
Philadelphia, standard	24.26 to 24.76
Furnace, copper-bearing	23.00 to 23.50

GRAY FORGE

Pittsburgh district fur.	18.50
Pittsburgh, delivered	19.13 to 19.63

CHARCOAL

Lake Superior, del. Chicago	27.04

SILVERY

Jackson County, O., fur., in per cents

5—$21.50; 6—$21.50; 7—$22.00; 8—$22.50 to $23.00; 9—$23.00 to $24.00; 10—$23.50 to $27.00; 11—$24.50 to $28.00; 12—$25.50 to $30.00; 13—$26.50 to $32.00.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents

10—$29; 11—$31; 12—$33; 13—$35; 14—$37; 15—$39; 16—$42; 17—$45.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.50
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ov., Connell. basis	6.50
Portsmouth, O., ov., Connell. basis	6.50
Buffalo ovens	8.75
Detroit ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross Ton, 51½%, Lower Lake Ports

Old range	$4.80
Mesabi	4.65
Old range	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58.65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.50 to 11.00
North African low phosphorus	10.50
Swedish basic, 65%	9.50 to 10.50
Swedish low phos.	11.00
Spanish, North African basic, 50 to 60%	9.50 to 10.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future, short ton unit, duty paid	12.00 to 12.50
Chrome ore, 48%, net ton c.i.f.	$21.50 to 22.50

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	30 cents
Indian, 48-50%	30 cents
Brazilian, 46-48%	28 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per net ton

9 x 4½ x 2½	65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore base	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$31.00
Pittsburgh, bessemer	31.00
Youngstown	31.00
Cleveland	31.00
Philadelphia	37.30
Chicago	32.00
Forging, Chicago	37.00
Forging, Pittsburgh	36.00 to 37.00
Forging, Philadelphia	42.30

SHEET BARS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00
Chicago	32.00

SLABS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.70c to 1.75c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$99.00
*Ferromanganese, del. Pittsburgh	103.79
Spiegeleisen, 19-21%, domestic fur. spot†	34.00
*Ferrosilicon, 50 per cent, freight all., c. l.	83.50
*Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon. cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.15 to 1.20
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do. one ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton, carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

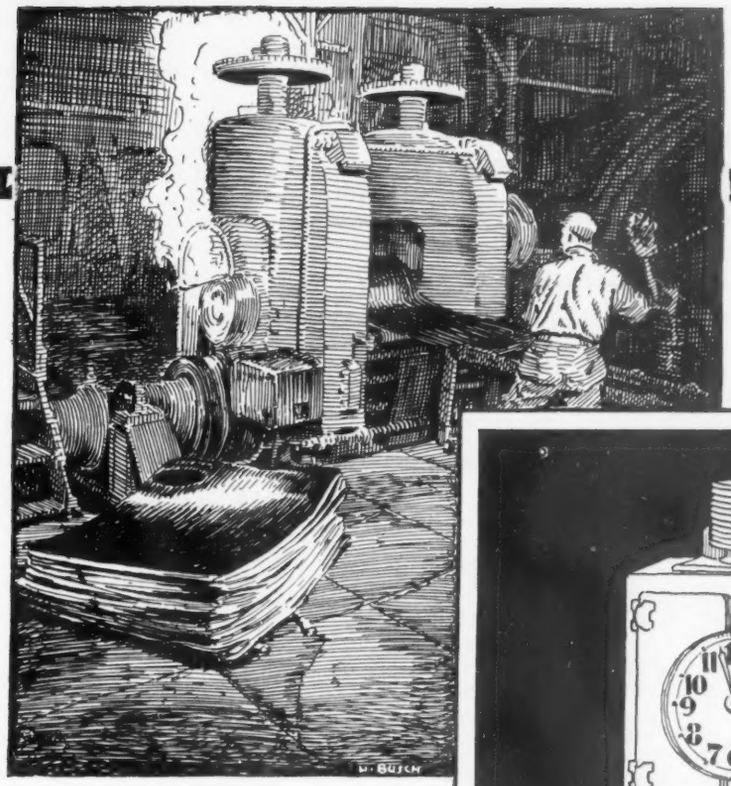
†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

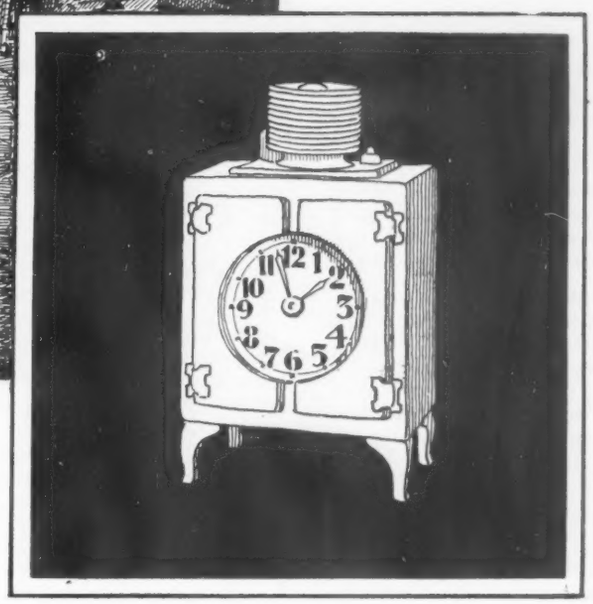
Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east. tide., gross ton	19.50 to 20.50



Hot Rolling



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Steel Sheets

Pig Iron

Hand-to-Mouth Buying Persists —Light Tonnage Closed for Third Quarter—Prices Steady

PIG IRON PRICES, PAGE 116

Pittsburgh—Buying of pig iron remains light, as to individual orders and aggregate tonnage. New business and shipments declined during June. Orders were about equal to production. Melters show no disposition to buy ahead. The price situation is unchanged. Small lots of No. 2 foundry and basic usually bring $18.50, base, valley, and malleable and bessemer $19. Lower quotations occasionally are noted on larger lots in competition with other districts. Cleveland iron is being offered in this district.

Boston—Sales of pig iron in New England amounted to less than 2000 tons in the past week. Mystic Iron Works booked half the tonnage. A Rhode Island melter is in the market for 1200 tons, and a Worcester, Mass., buyer wants 600 tons of malleable. Buffalo No. 2X iron is offered at $16, furnace, and other eastern sellers are meeting this price.

New York—Pig iron sales are light. The total for the past week is estimated at 5000 tons. Inquiries total 4000 tons and include 600 tons of No. 2 plain and No. 2X iron for the A. P. Smith Mfg. Co., Bloomfield, N. J. Buffalo iron continues $16 to $16.50, base, furnace, and southern iron $18 to $18.50, delivered, New York docks. New York Central railway inquiry for 300 tons, including No. 2 plain, No. 2X, No. 1X and a small quantity of charcoal iron, is understood to be closed.

It is reported here an eastern automobile builder is in the market for 10,000 tons of pig iron for the last half.

Philadelphia — Baldwin Locomotive Works, Philadelphia, has placed 1500 to 2000 tons of 2½ to 3¼ per cent silicon iron. This order was the principal feature of the market here in the past week. It is believed to have gone to a southern producer. Other sales were small. Eastern Pennsylvania foundry iron continues $19, base, furnace. Southern foundry iron is selling here in small lots at $12.25 to $12.50, base, Birmingham. A round lot of copper bearing, low phosphorus iron was sold in this district. This grade continues $23 to $23.50, eastern Pennsylvania furnace.

Buffalo—A blast furnace will be banked this week at the Lackawanna plant of the Bethlehem Steel Co., reducing the number active there to four and causing district operations as a whole to drop slightly under 50 per cent. A sharp reduction is noted in the number of open hearths in operation at Lackawanna. Merchants report pig iron business is dull.

Youngstown, O.—Third quarter contracting by pig iron consumers has dwindled to small proportions. Sellers have carried over some second quarter business as yet undelivered. Nominal quotations on No. 2 and basic are $18.50, valley, and on bessemer and malleable $19. Low phosphorus iron is $27, valley.

Cleveland—Pig iron sales and shipments in June were at a slightly lower daily average than in May. Carryover of unfilled tonnage from second to third quarter is not large because of the hand-to-mouth buying. Order books are thin but daily calls for prompt shipments of small lots keep operation steady. Sales for third quarter delivery by furnace interests with headquarters in Cleveland totaled 15,000 tons last week, 14,500 tons in the week preceding. Westinghouse Electric & Mfg. Co. is closing on third quarter requirements at Cleveland and Trafford City, Pa.; its inquiry for an indefinite tonnage was a step leading to a cut of 50 cents in Cleveland iron. No. 2 foundry and malleable now are $18, base, furnace, for local delivery, and it is believed $17.50 can be done in outside competitive territory. In western Ohio and Indiana, lake furnace quotation continues $18, base, and in Michigan $18.50 to $19, although less than $18.50 has applied on some orders in the competitive areas of western Michigan.

Chicago—June shipments of merchant pig iron fell below May. It is indicated one or more of the merchant stacks may be banked shortly. Five of the six available merchant furnaces now are active, as No. 4 Iroquois stack at South Chicago has just been blown out. The nominal price for northern iron is $18, Chicago furnace, for the base grades. Prices below that figure have been submitted on recent inquiries.

St. Louis—June pig iron business was slightly larger than that of May. An Illinois tractor builder purchased 2500 tons in the past week, and makers of stoves placed 1000 tons. Jobbing foundries took 850 tons. Inquiries for third quarter are increasing. The recent decline in prices at Chicago has caused melters to hesitate. In this district quotations remain unchanged, the leading local producer asking $18.50 to $19 for foundry and malleable. Southern iron is offered at a price equivalent to $13, base, Birmingham.

Cincinnati—Sales of pig iron in this district in the past week totaled about 5000 tons. A southern Ohio melter purchased 1000 tons of northern iron. Prices are unchanged.

Birmingham, Ala.—Production of pig iron in Alabama is starting the month at a slower rate than prevailed in June. Melters continue to buy on a hand-to-mouth basis, and demand is light. The price for delivery in this district is $14, base, furnace, while lower figures apply on shipments for outside competitive points.

Toronto, Ont.—The market is more active, with melters placing contracts for third quarter. The tonnage is well under that for either first or second quarter. Prices are unchanged.

Ferroalloy Shipments Lighter; Prices Steady

FERROALLOY PRICES, PAGE 116

New York—Demand for domestic spiegeleisen is not brisk, although sellers claim the reduction has not been comparable with the falling off in steel production, indicating relatively larger usage of this material. Domestic spiegeleisen, 19 to 21 per cent, is unchanged at $34, furnace, in carload lots, and ferromanganese $99, duty paid, to users of carloads to 500 tons annually.

Pittsburgh—Ferroalloy shipments remain light, decreases being shown in practically all grades since the first of June. Spot buying is quiet and prices generally are unchanged. Ferrotungsten continues dull, with the market $1.15 to $1.20. Ferromanganese is $103.79, delivered Pittsburgh, and spiegeleisen $34, furnace, both prices being for small lots.

8000 Tons Steel for Navy

Eight thousand tons of finished steel, chiefly plates, will be purchased for a new navy aircraft carrier, to have 13,800 tons displacement, cost $19,000,000, and on which bids will be asked by Washington shortly. Steel producers do not account as immediate any construction to arise out of the recent naval parley at London.

Scrap

Lighter Offerings Balance Smaller Demand but Prices Seek Lower Levels Steadily

Chicago—Less iron and steel scrap is being released in this market. Several railroad offerings are lighter, due to railroad shop layoffs and less track work. The Burlington and St. Paul lists last week contained 6000 to 8000 tons, the former being much below normal. Industrial releases are in keeping with recently reduced fabricating operations. As scrap melt has decreased in recent weeks the market is equalized, with no visible surplus. Some views are that unless finished steel prices recede further, scrap quotations may remain pegged near present levels. Yard shipments are light. Several dealers report sharp recessions from a month ago. Heavy melting steel is nominal at $12 to $12.50. Railroad melting steel is

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	10.50 to 12.00
Boston dealers	9.00 to 9.25
Buffalo, No. 1	13.00 to 13.75
Buffalo, No. 2	11.25 to 11.50
Chicago	12.00 to 12.50
Cinti, deal	11.00 to 11.50
Cleve., No. 1	12.00 to 12.50
Cleve., No. 2	11.25 to 11.75
Det., No. 1 deal	11.00 to 11.50
Det., No. 2 deal	9.50 to 10.00
East Pa., del. mill	12.50 to 13.00
N. Y. dl. R. R.	9.00 to 10.50
N. Y. deal No. 2	7.00 to 7.50
N. Y., deal yd.	6.25 to 6.75
Pitts. No. 1	14.75 to 15.25
St. L., No. 1 sel.	11.25 to 11.75
Federal, Ill.	11.00 to 11.50
Granite C., Ill.	10.00 to 10.50
Valleys, No. 1	14.75 to 15.25

COMPRESSED SHEETS

Buffalo, dealers	11.25 to 11.50
Chicago	10.50 to 11.00
Cleveland	11.50 to 11.75
Detroit, dealers	10.50 to 11.00
E. Pa. new mat.	11.50 to 12.00
Pittsburgh	14.50 to 15.00
Valleys	13.75 to 14.25

BUNDLED SHEETS

Buffalo	9.00 to 9.50
Cinti, deal	10.25 to 10.75
Cleveland	9.00 to 9.25
Eastern Pa.	9.50 to 10.00
Pittsburgh	12.50 to 13.00
St. Louis	6.50 to 7.00

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	8.00 to 8.50
Detroit, dealers	8.00 to 8.50
St. Louis	6.50 to 7.00

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	7.50 to 8.75
Buffalo	16.25 to 16.75
Chicago (3 ft.)	14.00 to 14.50
Chicago (2 ft)	14.50 to 15.00
Cinti, deal	17.00 to 17.50
Detroit, deal	15.00 to 15.50
Pitts. (open-hearth, 3 ft. and less)	17.00 to 17.50
St. Louis	14.50 to 15.00

STOVE PLATE

Birmingham	10.00 to 11.00
Boston, con.	9.00 to 9.50
Buffalo	11.00 to 11.50
Chicago, net	9.50 to 10.00
Cinti., deal. net	8.25 to 8.75
Det., net, deal	9.00 to 9.50
Eastern Pa.	10.00 to 10.50
N. Y., deal. mill	6.25 to 6.50
St. Louis	9.25 to 9.75

COUPLERS, SPRINGS

Buffalo	16.25 to 16.75
Chicago	13.50 to 14.00
Eastern Pa.	17.00 to 17.50
Pittsburgh	17.00 to 17.50
St. Louis	12.00 to 12.50

ANGLE BARS—STEEL

Chicago	13.00 to 13.50
St. Louis	10.50 to 10.75

LOW PHOSPHORUS

Buf., billets and bloom crops	17.50 to 18.00
Cleve. bil. and bloom crops	17.50
Eastern Pa.	19.50 to 20.00
Pitts. billet and bloom crops	19.00 to 20.00
Pitts. sheet bar crops	18.00 to 18.50

FROGS, SWITCHES

Chicago	13.00 to 13.50
St. Louis	11.00 to 11.50

SHOVELING STEEL

Chicago	12.00 to 12.50
Cleveland	9.00
St. Louis	10.50 to 11.00

RAILROAD WROUGHT

Birmingham	10.00 to 10.50
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	13.50 to 14.00
Chicago No. 1	11.25 to 11.75
Chicago, No. 2	12.00 to 12.50
Cinti. No. 2	11.00 to 11.50
Eastern Pa.	15.00 to 15.50
N. Y., No. 1 dl.	10.50 to 11.00
Pitts. No. 2	14.75 to 15.25
St. Louis, No. 1	9.00 to 9.50
St. Louis, No. 2	11.00 to 11.50

SPECIFICATION PIPE

Boston	7.00 to 7.50
Eastern Pa.	12.00 to 12.50
N. Y., deal	7.75 to 8.25

BUSHELING

Buffalo, No. 1	11.25 to 12.75
Chicago, No. 1	9.50 to 10.00
Cinn., No. 1 dl.	9.25 to 9.75
Cinn., No. 2	6.25 to 6.75
Cleveland, No. 2	8.50
Detroit, No. 1 new deal.	9.75 to 10.25
St. L. No. 1	9.25 to 9.75
Valleys new No. 1	14.25 to 14.75

MACHINE TURNINGS

Birmingham	7.50 to 8.50
Boston, dealers	4.00 to 4.50
Buffalo	8.75 to 9.00
Chicago	6.25 to 6.75
Cinn., deal	7.50 to 8.00
Cleveland	7.75 to 8.25
Detroit	6.00 to 6.50
Eastern Pa.	9.00
N. Y., deal	5.00 to 5.50
Pittsburgh	9.00 to 9.50
St. Louis	6.75 to 7.25
Valleys	10.50 to 11.00

BORINGS AND TURNINGS For Blast Furnace Use

Boston, deal	3.50 to 4.00
Buffalo	9.75 to 10.00
Cinn., deal	8.00 to 8.50
Cleveland	9.00
Detroit, deal	7.25 to 7.75
Eastern Pa.	8.50
N. Y., deal	4.25 to 5.00
Pittsburgh	9.25 to 9.75

CAST IRON BORINGS

Birming. chem.	12.00 to 13.00
Birming. plain	7.50 to 8.50
Boston, chem.	9.00 to 9.25
Boston, deal.	3.75 to 4.00
Buffalo	9.75 to 10.25
Chicago	7.75 to 8.25
Cinn., deal.	8.00 to 8.50
Cleveland	9.00
Detroit, deal.	7.50 to 7.75
Eastern Pa.	9.00
E. Pa., chem.	14.00 to 14.50
N. Y., deal.	6.50
Pittsburgh	8.50 to 9.00
St. Louis	9.25 to 9.50

PIPE AND FLUES

Cinn., deal	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	9.50 to 10.00
Chicago, net	8.50 to 9.00
Cincinnati	9.00 to 9.50
Eastern Pa.	10.00
N. Y., deal	6.50 to 7.00
St. Louis	10.00 to 10.25

FORGE FLASHINGS

Boston, deal.	7.25 to 7.50
Buffalo	11.25 to 11.50
Clev. over 10 in.	10.00 to 10.50
Detroit	9.50 to 10.00

FORGE SCRAP

Boston, deal.	6.50 to 7.00
Chicago	14.50 to 15.00
Eastern Pa.	12.00 to 12.50

ARCH BARS, TRANSOMS

Chicago, net	13.75 to 14.25
St. Louis	14.00 to 14.50

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	12.00 to 12.50
Chi. steelworks	9.50 to 10.00
Cleveland	11.75 to 12.00
Eastern Pa.	11.00 to 12.00
Pittsburgh	12.50 to 13.00
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	19.00 to 20.00
Bos., ship. pt.	16.50 to 17.00
Buffalo	16.00 to 16.50
Chicago	16.80 to 17.35
Eastern Pa.	21.00 to 21.50
St. Louis	16.00 to 16.50

SHAFTING

Bost., ship pt.	13.00 to 13.50
Chicago	16.25 to 16.80
Eastern Pa.	18.00 to 18.25
N. Y., deal.	13.00 to 14.00
St. Louis	13.00 to 13.50

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.25 to 13.75
Buffalo, steel	16.25 to 16.75
Chicago, iron	13.50 to 14.00
Chi., roll. steel	15.00 to 15.50
Cincinnati	12.00 to 12.50
N. Y., iron, dl.	10.00 to 10.50
Pitts., iron	15.50 to 13.00
Pittsburgh, steel	17.00 to 17.50
St. Louis, iron	12.00 to 12.50
St. Louis, steel	13.75 to 14.25
East Pa. steel	17.00 to 17.50
East Pa. iron	14.50 to 15.00

NO. 1 CAST SCRAP

Birming., cup	12.00 to 13.00
Buffalo	12.00 to 12.50
Boston, textile	11.50 to 12.00
Chicago, mach.	13.45 to 14.00
Chi., railroad	11.20 to 11.75
Chicago, agri.	10.90 to 11.50
Cinn., mach. cup., gross	17.75 to 18.25
Cleve, cupola	14.00 to 14.50
Det., net deal	10.00 to 10.50
East Pa. cupola	13.50
N. Y. cup. deal.	9.50 to 9.75
N. Y., del. loc. foundries	14.00
Pitts. cupola	14.00 to 14.50
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 ma.	12.00 to 12.50
St. L. No. 1	11.00 to 11.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast	14.00 to 14.50
Buffalo, break.	8.50 to 9.00
Cleve., break	9.00 to 9.50
Detroit, auto, net deal.	11.50 to 12.00
Det., break., dl.	7.00 to 7.50
Eastern Pa.	11.50 to 12.00
N. Y. No. 1 dl.	8.50 to 8.75
N. Y. break. dl.	7.25 to 8.60
Pittsburgh	11.50 to 12.00

MALLEABLE

Boston, R. R.	15.00 to 15.50
Buffalo	15.50 to 16.00
Chicago, agri.	12.25 to 12.75
Chicago, R. R.	13.50 to 14.00
Cinn., R. R. dl.	15.25 to 15.75
Cinn., agri., dl.	14.25 to 14.75
Cleve., rail	16.00 to 16.50
Det. auto deal.	13.50 to 14.00
St. Louis, rail.	11.00 to 11.50

RAILS FOR ROLLING 5 feet and over

Birming. cup	12.00 to 13.00
Boston	9.00 to 9.50
Buffalo	13.50 to 14.00
Chicago	14.50 to 15.00
Eastern Pa.	15.00 to 15.50
New York	9.50 to 10.00
St. Louis	12.00 to 12.50

LOCOMOTIVE TIRES

Chicago, cut	15.00 to 15.50
St. L. No. 1	13.00 to 13.50

LOW PHOS. PUNCHINGS

Chicago	13.50 to 14.00
Pittsburgh	17.50 to 18.00
Eastern Pa.	17.00 to 18.00
Buffalo	17.00 to 17.50

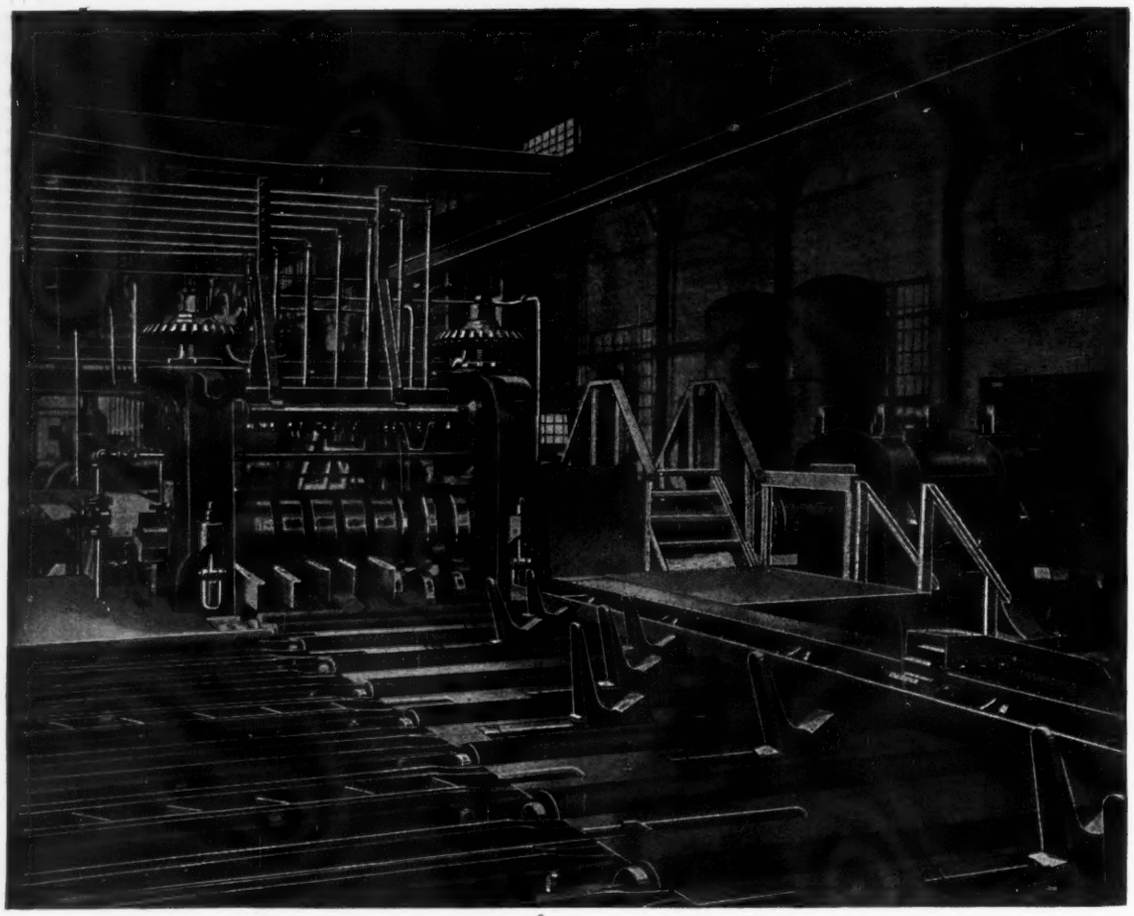
"NATIONAL"

Rolling Mill Equipment--

Baird Water Cooled Standings; Blooming Mills; Merchant Bar Mills; Sheet and Tin Mills; Chilled and Sand Rolls; Leveling Machines; Stretcher Levelers; Shears; Roll Lathes; Also Air Furnace Castings.

Let us figure on your requirements.

We have customers right in your district. Ask us for their names.



28" Two High Reversing Sheet Bar Mill

The National Roll & Foundry Co.

Avonmore, Pa., U.S.A.

MANUFACTURERS OF
COMPLETE ROLLING MILL EQUIPMENT
HEAVY AIR FURNACE CASTINGS AND "BAIRD" WATER COOLED STANDINGS

bringing $12.50 to $12.75, while dealers are buying against orders at $12.25 to $12.50. A number of dealers have orders on books to cover July, while a few can maintain active shipments through July and August. Railroad malleable remains quiet at $13.50 to $14. With merchant furnace output reduced and the remaining stacks idling, demand for cast borings remains light.

Boston—The market for scrap remains quiet. There has been some buying of railroad malleable for Connecticut consumption and some light buying in heavy melting steel, rails, steel turnings, chemical borings, but other lines are dull.

New York—General reduction continues to feature the iron and steel scrap dealers' buying market. Six grades have been marked down, comprising cast iron car wheels, grate bars, rails for rolling, foundry stove plate, long city wrought, and No. 1 railroad wrought.

Buffalo—Two more sales of heavy melting steel of small but representative tonnage are reported here. Both establish new low prices. No. 1 selected material was sold to a district steelworks at $13.75, 10 cents under the last sale, while ordinary No. 1 was sold at $13, or 25 cents under the last price. No. 2 was booked at $11.50, also a new low. Other markets are nominal.

St. Louis—The recent dull, weak status of the iron and steel scrap market here has been accentuated by the usual summer conditions. Purchasing has been at a minimum, with prices in some instances lower.

Birmingham, Ala.—Continued listlessness is noted, with quotations weak but at same levels as for some time. Dealers assert there is no buying, in fact, consumers dictating prices.

Toronto, Ont.—While a few melters have placed contracts for iron and steel scrap requirements to the end of September and others have indicated intention of placing forward delivery orders, most new business is for spot delivery. Mills are taking small tonnages of steel scrap, and foundries have recently curtailed purchases of iron grades.

Philadelphia—A round tonnage and several small lots of No. 1 heavy melting steel have been sold at $12.50, delivered, and the current market may be quoted at that figure. On scattered sales several other grades have sagged somewhat.

Pittsburgh—Demand for iron and steel scrap is fair, with the trend of prices mixed. Heavy melting steel has sold at $14.75 to $15.25 and the market is still quotable at that range. Steel specialties are off 50 cents while borings and turnings also are easier. Scrap rails are stronger on a sale at $15. The Pennsylvania railroad list for July totals 37,000 net tons, including 8200 tons of heavy melting steel.

Cleveland—Iron and steel scrap is at a standstill this week coincident with a further slump in steel operations. Only one of the three independent mills in the district is operating and this at less than 40 per cent. Demand for scrap is necessarily lacking. Slight dealer trading has developed still lower prices. Machine shop turnings are off to $7.50 to $8; borings and short turnings to $9 and No. 2 Busheling to $8.50. No. 1 steel continues nominally at $12 to $12.50, although a dealer reports purchases at $11.50. Other grades are nominal and unchanged in absence of trading.

Cincinnati—Reports of sale of a considerable tonnage of scrap, about half heavy melting steel, have failed to disclose the buyer. Prices obtained on this sale, shipments to begin at once and continue without holdup, sustain present quotations on heavy melting steel, rails, clippings and some other grades.

Coke

Seasonal Influences Retard Movement of Fuel to Users—Standard Grades Are Steady

COKE PRICES, PAGE 116

Pittsburgh—Spot demand for beehive coke is quiet. Shipments on contracts are fairly steady, but seasonally light. The movement of foundry coke is off moderately from the rate of a month ago. Sellers of standard fuel are encountering competition from inferior grades, but continue to hold their price at $2.50 for the furnace grade, and $3.50 to $4.85 for foundry.

Production of coke in the Connellsville region for the week ended June 21 was 32,100 tons, compared with 31,480 tons the preceding week and 102,190 tons in the same period a year ago, according to the *Connellsville Courier*.

Boston—Foundries are shutting down for vacations and there is little prospect for improvement in the coke market this month. Melters are well supplied. Prices are steady.

Cincinnati—Demand for by-product foundry coke shows no improvement. The price remains $10, delivered, Cincinnati.

St. Louis—Demand for coke is slowing down. Plants are closing for vacations, inventories and routine repairs and requests for delay in shipments are frequent. Coke production at by-product plants in June was the smallest for the month in many years. Prices are unchanged.

Semifinished Contracts Light for Third Quarter

SEMIFINISHED PRICES PAGE 116

Pittsburgh—Spot buying of semifinished steel continues quiet and users are slow to make forward commitments. Sheet, strip and bar mills have some stocks remaining and in view of light operations have little incentive to place additional semifinished tonnage. Prices are unchanged with rerolling billets, sheet bars and slabs generally $31, and wire rods $36.

Chicago—Semifinished shipments for second quarter gained over the first quarter. Billets, blooms and slabs are $32, base, Chicago. Wire rods are $37, Chicago.

Philadelphia — Billet business shows a slight improvement. Rerollers continue $32, base, Pittsburgh, and forging quality $37.

Youngstown, O.—Slowing down in independent sheet mill operations in this district has led to further restriction of open-hearth operations by makers of sheet bars. The same applies to strip mill activities here. Consumers of semifinished steel are buying on a hand-to-mouth basis. Sales of wire rods are more active. Billets, sheet bars and slabs hold at $31, Pittsburgh and Youngstown. Wire rods are $36, Pittsburgh and Cleveland.

Cleveland—Shipments of semifinished steel in June were below the daily average rate of May. Specifications for early July shipment continue at the June rate. The leading merchant producer is operating five of its 14 open hearths, the same as last week. Sheet bars, billets and slabs are $31, base, Cleveland and Youngstown, and while contracts have not been booked for a specific figure, $31 is to be named for delivery over the third quarter.

Pacific Coast

Steel Plant Extension Gives Structural Tonnage — Seattle Bridge Has Largest Total of Present Year Pending—Foreign Materials Arrive in Smaller Lots—Prices Changed Little

Seattle—Increased facilities are being constructed at the local plant of the Pacific Coast Steel Corp., including four structural steel additions of the same general type as the existing buildings. To the 22-inch mill an addition 84 x 160 feet is being built while the adjoining warehouse will be 75 x 160 feet. The addition to the 12-inch mill measures 84 x 160 feet, while the adjoining warehouse is being enlarged by an addition 60 x 75 feet. The improvements involve about 420 tons of structurals, of which the Pacific Car & Foundry Co., Seattle, will furnish 235 tons and Isaacson Iron Works, Seattle, has the contract for 165 tons. An addition to the open-hearth shop is being built by the Warrack Construction Co., general contractors.

Bids were opened at Olympia by Samuel J. Humes, engineer of the state highway commission, for construction of the superstructure of the Aurora avenue bridge, Seattle, the largest steel project of the year in the Pacific Northwest. United States Steel Products Corp. was low at $1,247,888. Other tenders were: Pacific Bridge Co., Portland, $1,347,774; Wallace Bridge & Structural Steel Co., Seattle, $1,482,313; General Construction Co., Seattle, $1,554,388; Hans Pederson, Seattle, $1,672,130. The figures were taken under advisement and award is expected to be made July 1. This job involves 3450 tons of carbon structurals, 4050 tons of silicon structural steel, 240 tons of castings and 500 tons of reinforcing materials.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00 to 26.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Mill prices of these items remain unchanged. Merchant bars and shapes are steady at 2.35c., reinforcing at 2.30c while plates seem to be holding firm at the higher level of 2.25c.

Sub-contracts for the Aurora bridge approaches, approximately 1000 tons are pending, while 500 tons additional, involved in the superstructure, will not be placed for some time as the general contract bids are being opened this week.

Reinforcing awards this week totaled 550 tons, in lots of 100 tons or more. These contracts were booked by the Northwest Steel Rolling Mills; 450 tons for the new plant of the *Seattle Times;* 100 tons for state highway projects.

Walla Walla, Wash., will receive bids July 9 for 10,000 feet of 20-inch 10-gage steel water pipe.

Isaacson Iron Works, Seattle, this week booked approximately 1200 tons of shapes for the following jobs: 800 tons for steel trestle on the Columbia river at Rock Island, Wash., for Stone & Webster; 200 tons in King County hospital, United Bakery Co., building and approaches for the Aurora bridge, Seattle; 185 tons addition to the Seattle plant of the Pacific Coast Steel Corp.

The Pacific Car & Foundry Co., Seattle, this week closed a contract to furnish 235 tons of structurals, a portion of the award involved in extensions to the local plant of the Pacific Coast Steel Corp.

O. F. Larson, Tacoma, is low bidder at $41,822 for the structural steel frame for Tacoma's proposed steam power plant, involving 357 tons of shapes.

Pipe Buying Fair

Olympia, Wash., has rejected bids for approximately 829 tons of cast iron pipe and new tenders will be received July 3. It was previously reported that 328 tons of 10 and 12-inch had been awarded to the Pacific States Cast Iron Pipe Co. French pipe was low for 501 tons of 16-inch. A. Del Guzzo, Auburn, Wash., has been awarded the contract for a water system at Kennydale, Wash. Vancouver, B. C., will open bids July 7 for 30,000 feet of 6-inch class C cast iron pipe totaling about 550 tons.

Most Sales in Small Lots; March Coast Imports Gain

San Francisco—(*By Air Mail*)—Little improvement in demand is noted and awards this week, with few exceptions, were confined to lots of less than 100 tons. The two largest lettings involved 645 tons of cast iron pipe for Fullerton, Calif., booked by the United States Pipe & Foundry Co. and 612 tons of structural shapes for a bridge over the Salinas river at Gonzales, Calif., secured by the Moore Drydock Co., Oakland.

The c. i. f. price on merchant bars and structural shapes has been reduced from 2.35c., to 2.25c and now corresponds to the quotations that have been in effect for some time on plates.

Imports of iron and steel products on the Pacific Coast during March figures for which have just been received, show an increase over February imports in coke, structural shapes and tubular products and a decrease in pig iron, bars and cast iron pipe. The aggregates for the major items were as follows, in tons:

	Mar. 1930	Feb. 1930	Mar. 1929
Pig iron	1,790	2,045	2,350
Coke	10,589	3,670	7,121
Bars	1,126	1,488	6,875
Shapes	4,822	3,160	4,366
Cast iron pipe	385	1,883	2,522
Tubular products	1,075	909	2,940

Bars, Plates and Shapes

Awards of reinforcing steel bars totaled less than 650 tons. This brings the total for the first half of the year to 26,246 tons, compared with 40,618 tons for first half of 1929. Blue Diamond Co. took 193 tons for the city of Los Angeles and the Concrete Engineering Co. booked 100 tons for a building for the R. K. O. studios in Los Angeles. Bids were opened this week on 415 tons for the Washington street bridge, Los Angeles, and on 2,500 tons for the Ford plant at Richmond, Calif. No change in out-of-stock prices is noted, 2.30c, base, on carload lots applying in the San Francisco district and 2.40c in the Los Angeles district.

Bookings of plate material totaled 625 tons and brought the aggregate for first half to 26,567 tons compared with 74,950 tons for the same period last year. The Western Pipe & Steel Co. was low bidder on 500 tons for a pipe line for the Salyer Consolidated Mining Co., San Francisco.

Demand for structural steel continues to show signs of improvement. Awards this week aggregated over 200 tons and brought the total for the first half of the year to 49,124 tons as compared with 112,175 tons for the corresponding period in 1929. During first half of last year, however, close to 22,000 tons were awarded for the Southern Pacific Co. bridge over the Carquinez straits of San Francisco bay. Bids were opened this week on 4,400 tons for the Ford plant at Richmond, Calif. Bids are being taken on 200 tons for a school in Salt Lake City. Plain structural material has been reduced from 2.35c., c. i. f. to 2.25c.

Steel and Cast Iron Pipe--Tubing

Welded Iron, Steel Pipe

Base Price $200 per ton

Base Discounts, Pittsburgh Lorain, O., to jobber in carloads

Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2 points less.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal
½	58	44½	½	22	2
¾	62	50½	¾	28	11
1—3	64	52½	1—1½	30	13

LAP WELD

2	57	45½	2	23	7
2½—6	61	49½	2½	26	11
7—8	58	45½	3—6	28	13
9—10	56	43½	7—12	26	11
11—12	55	42½			

BUTT WELD

Extra strong, plain ends

½	55	44½	¼—⅜	19	+54+
¾	60	49½	½	21	17
1—1½	62	51½	¾	28	12
2—3	63	52½	1—1½	30	14

LAP WELD

Extra strong, plain ends

2	55	44½	2	23	9
2½—4	59	48½	2½—4	29	15
4½—6	58	47½	4½—6	28	14
7—8	54	41½	7—8	21	7
9—10	47	34½	9—12	16	2
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, Lap Welded Steel		f.o.b. Pittsburgh Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

SEAMLESS TUBING

Cold drawn; f.o.b. mill

Random lengths over 5 ft.....55%
Selected lengths, 1 to 18 ft.....53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	47.20 to 49.20
Six to 24-inch, Chicago	43.20 to 45.20
Six-inch and over, N. Y.	38.50 to 40.50
Four-inch, New York	41.50 to 42.50
Stand. fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Houston	3.00c
Los Angeles	3.30c
New York††	3.10c
Philadelphia	2.70c
Pittsburgh	2.90c
Portland	3.00c
San Frans.	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.30c
Chattanooga	3.25c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
New York††	3.10c
Philadelphia	2.70c
St. Louis	3.15c
Tulsa	3.65c

REINFOR. BARS

Baltimore	2.50c-3.31c
Boston	2.665c
Buffalo	2.95c
Chattanooga	3.25c
Cincinnati	3.30c
Cleveland	2.25c-2.44c
Detroit	2.30c-3.00c
Houston	3.00c
Los Ang. cl	2.40c
Los Ang. lcl	2.70c
New York	2.65c-3.10c
Philadelphia	2.55c
Pittsburgh	2.75c
San Fran. cl	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.30c
New York	3.10c
Philadelphia	2.60c
Pittsburgh	3.00c
Portland	3.00c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.40c
Chattanooga	3.35c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Clev., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Ang.	3.30c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	3.00c
Portland	3.00c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.75c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.85c
New York	3.40c
Portland	3.75c
Phila. *†	3.15c
Pitts. **	3.25c
San Fran.	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.54½c
Tulsa	3.95c

NO. 24 BLACK

Balt. *†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	4.05c
Cincinnati	4.05c
Clev. ***	3.75c
Detroit	3.95c
Los Ang.	4.75c
New York	3.55c to 3.65c
Phila. *†	3.70c
Pitts. **	3.65c
Portland	4.90c
San Fran.	4.90c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.45c

NO. 24 GAL. SHEETS

Balt. *†	4.50c
Boston	5.45c
Buffalo	4.40c to 4.60c
Chicago (lc. del.)	4.60c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.60c
Houston	5.40c
Los Ang.	5.20c
Pitts. **	4.30c
New York	4.25c
Phila. *†	4.25c
Pitts. **	4.30c
Portland	5.50c
San Fran.	5.30c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.65c
Chattanooga	3.45c
Chicago	3.20c
Cincinnati	3.50c
Cleveland	3.25c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York	3.40c
Philadelphia	3.00c
Pittsburgh	3.25c
Portland	4.15c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.50c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	4.05c
Chicago	3.75c
Cincinnati	4.05c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia	3.25c
Pittsburgh	4.25c
Seattle	5.15c
St. Paul	4.00c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San. Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100-in 500 lbs. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
New York	5.05c
Phila. (c)	4.95c

(b) Net base, straightening, cutting, boxing 1 ton or more.

(c) Plus mill, size and quantity extras.

††Domestic bars.

*Plus quantity extras.

**Less than 25 sheets.

*†50 or more bundles.

***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

Cleveland-Cliffs

IRON ORE · PIG IRON · COAL · COKE

Coal laden lorries riding the tops of coke oven batteries... dumping their loads into open charging holes. Below, a long line of clay-sealed ovens . . . baking coal free of its by-product gases. An oven door opens . . . a block of hot coke is slowly forced out . . . tumbles into a hopper... to the cooling spray of the quenching house . . . then to dry and screen. Cleveland-Cliffs Coke is of guaranteed analysis. Its high metallurgical standards meet all blast furnace and domestic requirements.

THE CLEVELAND-CLIFFS IRON CO · CLEVELAND · OHIO

Metals

New Business Continues Light and Prices Weak—Aluminum Cut 1 Cent—Copper Holds

New York—New business in nonferrous metals remains seasonally light and prices continue weak. Some new cuts have been made in the past week, so that most prices are at the lowest levels since the depression of 1921.

Zinc is outstanding in this respect, as it has continued to fall rapidly, while in most other metals more resistance to weakness has been evident in the past few days. Aluminum, after remaining unchanged for more than two years, has dropped off, so that only nickel remains unchanged.

Whether or not prices slip further it is generally accepted that they are near the bottom. The present situation is remarkably parallel with that of the early summer of 1921. At that time the depression in prices reached approximately its low point.

Brass and copper mill products are in a quiet market, in which shipments of copper wire against recent orders are going at a fair rate, but specifications for brass are slow and mill operations in some instances are not much above half of capacity. Copper wire and product prices are firmly established on the basis of 12.00c for copper.

Copper—Very light domestic sales have been made in the past week on the basis of 12.00c, Connecticut, Export business has been less than normal. Copper originally bought for June shipment has been well taken out by consumers, and it appears as if the June statistics would make a stronger showing.

Zinc—Prime western has sold down this month from 4.65c East St. Louis, to 4.15c, or just 2½ points below the lowest figure touched in 1921, and otherwise the lowest since the panic of 1907.

Tin—This metal has fluctuated rapidly in the past week, due to alternate views on curtailment. In the past few days, the curtailment movement has appeared to take on more definite form of the Orient. It is now said that many mines in the Malay peninsula, Burma and Siam will close down for two months this summer. Dealers have been buying tin on the exchange and in the Straits market for various positions through the summer, but consumers in the past week have continued to do very little.

Lead—Buying has been a little more active in this metal than in others in the past week, due to the fact that consumers were poorly covered on nearby needs.

Aluminum—Ingots and sheets were cut 1 cent but new business remains light.—*Daily Metal Trade.*

Mill Products

Base price cents per pound f.o.b. mill, except where otherwise specified Copper and brass product prices are based on 12.00c, delivered Connecticut, for copper

SHEETS	
Yellow brass (high)	18.75
Copper, hot rolled	21.75
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-pound base)	10.00
TUBES AND PIPES	
Seamless yellow brass (high)	23.75
Seamless copper	24.00
RODS	
Yellow brass (high, full turnings)	17.00
Naval brass	19.87½
ANODES	
Copper, untrimmed	19.25
WIRE	
Yellow brass (high)	19.25

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	7.25 to 7.50
Chicago	7.00 to 7.25
Cleveland	7.25 to 7.50
St. Louis	7.00 to 7.50
HEAVY YELLOW BRASS	
Cleveland	4.50 to 5.00
HEAVY COPPER AND WIRE	
New York	8.50 to 9.00
Boston	8.50 to 9.00
Chicago	9.25 to 9.50
Cleveland	8.00 to 8.50
St. Louis	7.50 to 8.00
RED BRASS AND WIRE	
New York	6.75 to 7.25
YELLOW BRASS TUBING	
Cleveland	4.25 to 4.50
LIGHT COPPER	
New York	7.00 to 7.50
Chicago	7.25 to 7.50
Cleveland	7.00 to 7.50
St. Louis	7.00 to 7.50
LIGHT BRASS	
Boston	4.00 to 4.50
Chicago	3.75 to 4.00
Cleveland	3.00 to 3.50
St. Louis	4.00 to 4.25
ZINC	
New York	2.00 to 2.50
Cleveland	1.75 to 2.00
St. Louis	2.00
ALUMINUM	
Clippings, soft, Cleveland	12.00 to 12.50
Clippings, hard, Cleveland	10.00 to 10.50
Borings, Cleveland	5.50 to 6.00
Cast, Cleveland	7.25 to 7.50
Cast, Boston	7.50 to 8.00
Cast, St. Louis	7.50

Secondary Metals

Remelt aluminum No. 12	15.50
Brass ingot, 85-5-5-5	11.50

Coke By-Products Slow; Naphtha Off 3 Cents

New York.—Xylol and solvent naphtha are down three cents to 25.00c per gallon in tank shipments and 30.00c in drums. This completes the downward revision in light oil distillates since the first break in benzol in May. Demand is spotty, although benzol stocks find a ready outlet.

Naphthalene shipments are beginning to slow down after an active season. Most contracts have been covered and from now on spot business is likely to lead, with a tendency toward curtailment in both shipments and output. Prices hold.

Phenol buying is uneven and slower. Prices continue steady.

Sulphate of ammonia with some distributors has been moving better than expected after a late start with fertilizer interests. Moderate export business is reported. Prices are steadier.

Coke By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½
Per 100 Pounds Delivered	
Sulphate of ammonia	$2.10 to $2.20

Prices of the Week, Cents a Pound

	Copper: Electro delivered	Copper: Lake delivered	Copper: Casting refinery	Straits Tin: Spot New York	Straits Tin: Futures New York	N. Y. Lead	St. L. Lead East	St. L. Zinc	Aluminum 98-99%	Antimony Spot	Nickel Ingot
June 25	12.00	12.07½	11.80	31.10	31.45	5.25	5.15	4.22½	23.90	7.00	35.00
June 26	12.00	12.07½	11.80	30.40	30.80	5.25	5.15	4.20	22.90	7.00	35.00
June 27	12.00	12.07½	11.80	30.87½	31.30	5.25	5.15	4.15	22.90	7.00	35.00
June 28	12.00	12.07½	11.80	.....	.....	5.25	5.15	4.15	22.90	7.00	35.00
June 30	12.00	12.07½	11.80	30.37½	30.65	5.25	5.15	4.10	22.90	7.00	35.00

Europe

Heavy Steel Prices Reaffirmed in England—Markets Generally Depressed in All Countries

Birmingham, Eng. — (*European Staff Service*)—The quarterly meeting of the Steel association was held in London this week when it was decided to make no change in the existing prices of heavy steel. This has caused some disappointment among users, but steel manufacturers are of the same opinion as pig iron producers inasmuch as they believe that lower prices are not likely to bring substantial buying in present conditions. Steel users in many cases have more steel on hand than they are likely to use for some time and are not to be persuaded into new contracts by offers of cheap material.

The all-round reductions in ironworkers wages and materials in Germany is having its reaction in the Midland market. Merchants are able to do quite a large business in German strip but find customers are already calculating how much less they will have to pay for German material although as yet the reductions have affected only the German domestic market. With regard to other Continental products, Birmingham merchants consider that a severe strain is being put upon the cartel and they believe that the breakdown of price control cannot be long delayed. Foreign works are desperately in need of orders and are resorting to various methods to offer steel below the fixed minimum of the cartel. Demand from Midland works, however, is no better than it has been during the past few months and there is therefore no occasion for cutting among sellers who still adhere to £5 7s 6d ($26.11) f.o.b., for steel bars, and £4 14s ($22.83) for 2-inch billets. Some low prices for plates are heard and Belgian No. 3 iron bars can also be bought on advantageous terms. Steel strip costs £6 17s 6d ($33.40), delivered in this district, and local works are buying a fair tonnage.

In South Staffordshire makers of finished iron find conditions extremely dull. June is always a poor buying month as many inventories are being taken. One or two marked-bar mills have an unbroken record of operations for many months and there are signs that this activity will be upheld to the end of the second quarter. Competition is keen among iron strip makers and producers of crown bars and this keeps values on an unremunerative level owing to the high costs of production.

Pig iron buying is restricted to small tonnages for immediate consumption. Consumers are not arranging fresh contracts and are of the opinion that furnacemen will be unable to maintain the strong position which they have taken in regard to prices. The tonnage of pig iron being absorbed is no greater and stocks are accumulating, particularly in Northamptonshire. Derbyshire is more fortunate where furnaces are allied to pipe-making concerns, which are taking a very fair proportion of the output. Municipal contracts for cast iron pipe are flowing in at a good rate, partly because they are being used in reconstruction schemes backed by the government in order to relieve unemployment.

In the Middlesbrough district output has been curtailed to prevent large accumulations of stock. Even so one or two firms are still contemplating the damping down of furnaces and have placed their men on short notice, intimating that unless accumulated stocks can be disposed of pig iron making will have to cease. East coast hematite is weak and the selling price is below the cost of production. Cheap Continental iron is competing keenly with English hematite in foreign markets.

Prices of west coast hematite appear to be stabilized at the lower level decided upon a few weeks ago. The local consumption is still substantial and a little business is being done with the Continent. At the steel works at Barrow and Workington there is sufficient business to keep mills employed for a few weeks but when orders for rails now being executed for home and overseas customers are completed manufacturers will be anxiously seeking fresh business.

In the smaller sizes of steel and in semifinished material no business is moving. Rerollers of foreign billets are not buying from the Continent as they have stocks. English steelworks are short of orders for billets, sheet bars and small steel bars.

Galvanized sheet manufacturers in the Midland district have improved their position slightly and have three or four weeks work in hand. Inquiries are a little more promising but the chief overseas markets show no signs of recovery from the low level to which they have sunk. In South Wales the market for sheets is still quiet and in the first five months of this year the total British exports show a falling off of 127,000 tons compared with the same period of 1929. Shipments of tin plates in May show a sharp recovery of over 13,000 tons, although here again the total for January to May is much below that of last year. Consumers of tin plates are pressing for reductions on the ground of cheaper tin but so far prices have not fallen below 18s ($4.38) per basis box. Output is fairly constant apart from interruptions under the Welsh scheme of control and stoppages for hot weather. Inquiries encourage the hope that a fair trade will be maintained in third quarter.

Foreign Markets Depressed; Scotch Pig Iron Lower

London (*By Cable*)—European iron and steel producers do not expect an immediate improvement in the dull market situation that has existed for several months. Following a reduction of wages and prices in Germany there has been a slight increase in domestic orders, but the belief prevails the bottom of the depression has not been reached. Market sentiment in Belgium is worse and this is ascribed mainly to the new American tariff and price reductions in Germany. In France the only betterment noted is in demand for agricultural implements.

Structural work in Great Britain is restricted to small projects. Steel requirements of builders of automobiles and heavy road vehicles are the mainstay of the market. Pig iron producers in the Midland refuse to reduce prices despite a reduction of 7 shillings ($1.70) per ton in furnace coke since the pig iron prices were fixed nine months ago. Business is slow and stocks are increasing. No improvement is expected before fall. Scotch foundry iron has been marked down 1s 6d (36 cents) per ton.

Rebates Cut Entente Prices on All Belgian Sales

Brussels—The Belgian iron and steel market remains lifeless, and the volume of orders is insufficient to absorb even present restricted production. Business this week, however, has not been so bad as during last week, as there were more orders on the market, and at the meeting of the iron and steel exchange more tonnage was transacted. The main topic has

JOYCE-CRIDLAND JACK

Castings by COMMERCIAL

A Joyce High Speed Self Lowering Jack, upright type, 50 to 100-ton capacity. One of the many types of jacks and lifts manufactured by the Joyce-Cridland Company, Dayton, Ohio

Since 1873 the Joyce-Cridland Company have been outstanding manufacturers of high grade hoists, jacks, and lifts for every purpose. The tremendous lifting power of Joyce Jacks makes it absolutely essential that castings used in their manufacture are able to withstand terrific weights and strains.

The main castings for Joyce High Speed Jacks are made by The Commercial Steel Castings Company. To pass the rigid requirements of this type of work castings must be of high grade steel, perfectly cast, skillfully made, and free from imperfections. Ability to withstand cross-strains and extraordinary weight is imperative. Commercial Steel Castings have proven very satisfactory.

THE COMMERCIAL STEEL CASTING CO.

Subsidiary of The Osgood Company

MARION, OHIO

Sales Offices

416 First National Bank Bldg. Cincinnati, Ohio	1002 Tribune Bldg. New York City	1623 Conway Bldg. Chicago, Ill.	Fisher Bldg. Detroit, Mich.	620 National Bldg. Cleveland, Ohio

been the determination of rebates for the various products controlled by the entente. Nobody speaks about the prices of such and such a product, but about the rebate to be set upon the entente's prices. There is a list of rebates, just as previously there was a list of the prices for the different metallurgical commodities.

Summing up the general aspect of the export market, one must say that the works take orders at any prices, taking no notice of the prices imposed by the entente. It is true to add that the prices written down on the order-forms are the official prices of the cartel, but there is a counter-indication given in another communication, fixing the rebate allowed. The present rebates are as follows: for merchant bars, 5s ($1.21); for beams, 7s ($1.70); for semifinished products, 3s to 4s (73c to 97c).

The consequence of this new policy of the producers is that there is better activity in the Belgian works, as orders have been booked.

In wire the situation is unsatisfactory. Prices are low, but there are no orders on the market, and as a result wire rod mills are in a poor state, and in the international comptoir the Belgian group is behind by 14,000 tons. Each group accepts orders at any price, especially orders from Japan, where American competition is severe. A new meeting is to be held this week at Liege to organize the British market for semifinished products.

In the domestic market No. 3 foundry pig iron continues at 620 francs per ton for lots up to 100 tons, 615 francs for lots between 100 and 500 tons, and 610 francs over 500 tons.

Germans Argue Wage Cuts and Decreased Prices

Berlin—After a lapse of more than two years, domestic iron and steel prices now have been reduced on the average by 4 marks per metric ton. This reduction corresponds to the last increase of prices in May, 1928, and as at the same time wages have been cut by 7½ per cent, it is stated that the producers are not making any sacrifice. The workers even claim that the reduction of prices amounts to just the same percentage of 7½ per cent as the producers save by cutting the wages, while the producers claim that the reduction in wages results in a saving of only 22,500,000 marks, and that the cut in prices costs them altogether 40,000,000 marks. However, these latter calculations seem to be made for propaganda purposes. Prices per metric ton have been reduced by only 2.7 to 3.3 per cent. The working-up concerns claim that the reduction in steel prices is inadequate, and they hope that their other raw materials also will be cheapened.

The reduction of prices so far has not resulted in revival of business, and it is scarcely expected that such an improvement will follow for a while. The general economic tide in Germany is too unsatisfactory to look forward to increased sales. The shortage of capital handicaps all business, and although the government now is trying to find new funds to stimulate building activities, it is not believed that this action will meet with much success. The machine-makers are working only at about 60 per cent of capacity, a percentage which also applies to other iron and steel consumers. Although the Young loan now has been floated, it is not expected that much foreign money will flow into Germany, due to the unsatisfactory conditions on foreign bond markets. Dismissals in the heavy industry are, therefore, increasing every day. The Hoesch iron and steel works have given notice to about 1200 workers for the end of this month, the Stinnes coal mines will reduce their staff by about 800, and the United Steel Works by 1200.

Belgian Exports Make Record

Brussels—(*European Staff Service*)—Belgian and Luxemburg exports of pig iron during April were an increase over March. Exports of other iron and steel products in April reached the highest figure for the year. The principal items exported were: structural steel, 61,691 tons: plates and sheets, 57,794 tons; semifinished steel, 53,133 tons; wire, 28,180 tons hoops, 17,815 tons; rails, 17,785 tons; scrap, 37,587 tons.

Imports of pig iron and steel into Belgium and Luxemburg in April were below these of March. Comparisons follow, in metric tons:

Mon. ave.	Pig iron	Other iron and steel	Pig iron	Other iron and steel
1927	31,760	28,000	11,350	388,000
1928	45,910	38,000	8,240	380,000
1929	56,150	37,000	10,090	394,500
1930				
Jan.	44,274	37,200	13,551	392,000
Feb.	38,121	32,700	7,320	295,600
Mar.	42,240	29,600	9,412	403,900
April	36,504	26,200	10,624	436,400

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 30

Export Prices f. o. b. Ship at Port of Dispatch—By Cable

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
PIG IRON	£ s d		£ s d		£ s d		£ s d	
Foundry No. 3, Silicon 2.50-3.00	$16.40	3 7 6*	$16.28	3 7 0	$16.28	3 7 0	$16.28	3 7 0
Basic-bessemer	15.92	3 5 6†	15.07	3 2 0	15.07	3 2 0	15.80	3 5 0
Hematite, Phosphorus 0.02-0.05	17.50	3 12 0	24.69	630*	.....	.....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$29.77	6 2 6	$22.84	4 14 0	$22.84	4 14 0	$22.60	4 13 0
Wire rods	41.31	8 10 0	30.38	6 5 0	30.38	6 5 0	30.38	6 5 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars	1.74c	8 0 0	1.18c	5 7 6	1.18c	5 7 6	1.18c	5 7 0
Structural shapes	1.68c	7 15 0	1.12c	5 1 6	1.12c	5 1 6	1.12c	5 1 6
Plates, ship, bridge and tank	1.79c	8 5 0	1.44c	6 10 6	1.44c	6 10 6	1.49c	6 15 0
Sheets, black, 24 gage	2.17c	10 0 0	2.15c	9 15 0	2.15c	9 15 0	2.20c	10 0 0
Sheets, galvanized, 24 gage, corrugated	2.47c	11 7 6	2.52c	11 8 9	2.52c	11 8 9	2.97c	13 10 0
Bands and strips	2.17c	10 0 0	1.29c	5 17 6	1.29c	5 17 6	1.29c	5 17 6
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.43c	6 10 0
Galvanized wire, base	3.04c	14 0 0	1.76c	8 0 0	1.76c	8 0 0	1.73c	7 17 0
Wire nails, base	2.39c	11 0 0	1.46c	6 12 6	1.46c	6 12 6	1.49c	6 15 0
Tin plate, base box 108 pounds	$ 4.43	0 18 3	.....	.....	.....	.....	$ 8.99	1 17 0

*France

Domestic Prices at Works or Furnace—Last Reported

			Francs			Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.40	3 7 6	$19.26	490(2)	$17.30	620	$20.26	85
Basic pig iron	15.92	3 5 6	20.63	525(1)	15.07	540	21.69	91
Furnace coke	3.40	0 14 0	6.60	168	6.00	215	5.13	21.50
Billets	29.77	6 2 6	24.36	620	22.60	810	28.85	121
Standard rails	1.79c	8 5 0	1.46c	810	1.62c	1,245	1.51c	140
Merchant bars	1.74c	8 0 0	1.22c	680	1.25c	965	1.52c	141
Shapes	1.84c	8 10 0	1.26c	700	1.22c	940	1.49c	138
Plates, ship, bridge and tank	1.95c	9 0 0†	1.46c	810	1.52c	1,170	1.71c	158
Sheets, black, 24-gage	2.28c	10 10 0	2.72c	1,510	2.60c	2,000	1.40c	130
Sheets, galvanized 24 gage, corrugated	2.58c	11 17 6	3.52c	1,955	3.06c	2,300	3.78c	350
Plain wire	2.06c	9 10 0	2.03c	1,125	2.15c	1,650	2.43c	225
Bands and Strips	2.17c	10 0 0	1.37c	760	1.50c	1,150	1.77c	164

‡Middlesbrough; †Basic; °delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke L0 13s 0d ($3.16) f. o. b. Ferromanganese L19 6s 0d ($93.80) delivered Atlantic seaboard, duty paid. German ferromanganese L15s 0s 0d $72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

Machinery

Dullness in Buying and Inquiry Continues—Middle West Is Most Active

New York—Machine tool inquiry and buying continue to sag. Dullness is general in all types of equipment, although some milling machine builders have a few orders. Shops have curtailed to skeleton forces. While some dealers appear to feel that the fall will bring a spurt, others see no pronounced increase likely even with the resumption of industry generally. They take the view that some of the best buyers of machinery are tooled to handle any moderate increase in business which may materialize.

Frankford arsenal, Pa., is in the market for a few tools including two rotary grinding and polishing machines, three automatic screw machines, three butt welding units, a nibbler and a gear testing machine. The board of transportation is asking bids on several cranes for its Harlem river shops. Machine tool requirements are not yet out. Milwaukee Electric Crane & Hoist Corp. was low on a bridge crane for the bureau of yards and docks, navy department. The navy department has closed on several tools for eastern yards, including a miller and engine lathes for Brooklyn.

Buying is generally limited to one or two tools at a time. Sales forces are following all leads likely to develop into business. As a result considerable pending inquiry has been definitely eliminated. Export business is also slower. A large list still pends for Russia.

Pittsburgh—Machine tool sales are in fair volume considering general industrial activity and one seller reports June business equal to that of a year ago. Inquiry is well maintained and pending work is in sufficient volume to provide a satisfactory rate of business over the next few months provided releases are forthcoming on this equipment. Most inquiries involve only a few tools at a time and awards also are confined to small lots.

Chicago—Tapering of orders for machine tools in the last week reduced June sales below expectations. A number of houses report lighter net business than in May. Fair scattered inquiries are before the trade, but no large lists. Illinois Steel Co. has a list of about $100,000 in shear equipment, but few sales offices in this territory will be able to bid, and the material likely will go to eastern manufacturers. Machine tool equipment for that steel company's expansion program at South Chicago and Gary will not be placed for some time. Two large lathes have been purchased in this market for iron ore mining interests in the Northwest. Chicago board of education will close on 18 lathes, drills and other equipment for Austin high school about July 9. The board is inquiring for an engine lathe, dry grinders, a single spindle floor grinder and other equipment for new Farragut junior high school. Some of the machine tool builders now are operating only three days a week, and most of them are on reduced working hours.

Cleveland—Orders and inquiry for machine tools have dropped another notch but dealers and builders are making the best of an adverse situation. What few machines are being sold are mostly single items for replacement. The opinion has been expressed that many companies are in a position to buy considerable equipment but are loath to sanction the expenditure of any sizable sum of money at the present. Used equipment is moving slowly but dealers are allowed more time to put this type of machinery into better condition than previously. Sales in the Detroit district are reported to be improving. The wholesale scrapping of decrepit automobiles and the fact that several companies will be closed for two-week vacation periods are considered as influences working for better machinery buying. Some cancellations have been received but they are usually accepted cheerfully. Prospects for the next two months are still somewhat uncertain.

Machinery Exports Are Up

American exports of strictly industrial machinery for the first four months of 1930 reached a total value of $87,533,000, or about 4 per cent more than for the corresponding period of last year, according to the industrial machinery division, department of commerce. Construction machinery, well and refinery machinery and metalworking machinery largely accounted for this gain, being exported in such increased volume as to offset declines in steam engines (other than locomotives), pumping and textile machinery.

Foreign shipments of metalworking machinery continue to show the upward tendency which has been in evidence, over a considerable period. In power-driven metalworking machinery the gain for April was 50 per cent and for the longer period, 22 per cent. Drilling forging foundry and molding equipment has shown especial activity. There was little change in shipments of other metalworking machinery, either for April or for the first four months.

Government Uses Iron in New Printing Plates

Co-operating with the bureau of engraving and printing, the bureau of standards, Washington, has developed a new process for making printing plates. For the past several years most of the plates used at the bureau of engraving and printing have been made by an electrolytic process, somewhat similar to electrotyping. These plates have consisted largely of nickel and copper with a surface of chromium, the resulting metal being extremely hard.

To simplify the process and to reduce cost, some of the plates now are being made by depositing iron instead of copper and nickel. The solution used contains an iron salt and iron anodes are used, the deposit of iron being strong and tough. When plated with chromium to harden the surface, the plates are found to give satisfactory service.

Wright Flush Valve Corp., 228 North LaSalle street, Chicago, has increased capital from $150,000 and 10,000 shares no par value to $150,000 and 30,000 no par value.

Exports of Metalworking Machinery

	May		January through May	
	1930	1929	1930	1929
Engine lathes	254	54	618	382
Turret lathes	57	25	207	248
Other lathes	94	105	371	407
Vertical boring mills and chucking machines	8	34	122	131
Thread-cutting and automatic screw machines	75	73	368	395
Knee and column type milling machines	21	24	159	198
Other milling machines	80	32	376	301
Gear-cutting machines	40	42	193	207
Vertical drilling machines	41	27	295	179
Radial drilling machines	12	14	99	54
Other drilling machines	90	160	972	841
Planers and shapers	49	33	213	213
Surface grinding machines	19	21	130	62
External cylindrilcal grinding machines	78	47	301	365
Internal grinding machines	28	47	227	209
Tool grinding, cutter grinding, and universal grinding machines	182	95	784	664
Pneumatic portable tools	1,938	2,140	8,976	10,583
Chucks for machine tools	2,778	1,028	14,468	7,669

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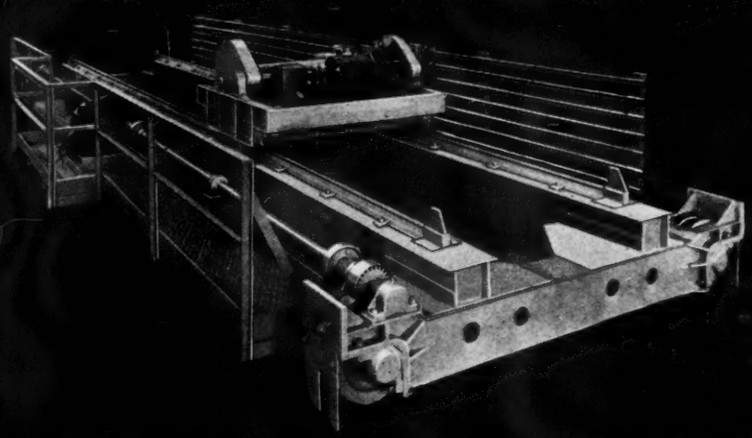

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New England

WESTBROOK, ME.—Portland water district, 16 Casco street, Portland, Me., will build a 2-story shop and service building at a cost of about $40,000. Plans are being prepared. J. C. & J. H. Stevens, 477 Congress street, Portland, Me., are architects.

ATHOL, MASS.—Union Twist Drill Co. has awarded contract for the construction of a 2-story plant and office building to the Austin Co., 16112 Euclid avenue, Cleveland. Cost of entire project, including equipment, estimated at $1,000,000.

ATTLEBORO, MASS.—General Plate Co., manufacturer of wire and tubing, will construct a 1-story service garage at an estimated cost of $40,000. Contract has been awarded.

GLOUCESTER, MASS.—Board of water commissioners, 10 Proctor street, has closed bids for a waterworks system, to include a pumping station. Total cost approximately $250,000. Fay, Spofford & Thorndike, 44 School street, Boston, are engineers.

LAWRENCE, MASS.—Meadow Brook Laundry Co., 17 North Methuen street, is receiving bids for the construction of a power house costing $40,000 with equipment on Methuen street. H. Petzold, Bay State building, is engineer.

MANSFIELD, MASS.—Trustee of F. Boltz, care L. G. Foster, 101 North Main street, is receiving bids for construction of an airport to cost about $30,000. Hangars and machine shop units will be built.

MILFORD, MASS.—Peterson Bros. Tool Co., 151 Purchase street, manufacturer of gages, tools and parts, will erect an addition to its 30 x 42-foot plant this summer. Arthur Peterson is president.

WORCESTER, MASS.—Worcester Electric Light Co., 11 Foster street, has awarded contract to New England Power Construction Co., 89 Broad street, Boston, for a power substation at Worcester. Estimated cost, over $40,000.

CRANSTON, R. I.—Universal Winding Co., 95 South street, Boston, will construct a 3-story plant here, 58 x 161 feet, at a cost of about $80,000. Plans are private. Company manufactures textile machinery.

New York

BROOKLYN, N. Y.—W. C. Martin, superintendent of school buildings, Flatbush avenue and Concord street, has closed bids on equipment for public school No. 10, on Seventh avenue, including machinery and shop equipment.

NEW YORK—New York Central railroad, 466 Lexington avenue, J. M. Doorly architect, proposes to build a 1-story, 37 x 61-foot boiler house at Marble Hill avenue and West 228th street, at an approximate cost of $30,000.

UTICA, N. Y.—Newell Welding & Auto Radiator Works, care Walter J. Newell, 244 Elizabeth street, manufacturer and repairer of automobile radiators, has purchased a new plant at 405 Broadway.

WOODSIDE, N. Y.—Car barns of the New York & Queens County railway, Elmhurst and Steinway railway, Woodside, were damaged by fire recently. Estimated loss, $500,000.

Pennsylvania

ALLENTOWN, PA.—Utilities Service Co. Inc., 913 Hamilton street, noted as recently organized, advises through M. W. Wertman manager, that production was scheduled to begin July 1. Company manufactures pole-line hardware and electrical distribution and transmission equipment. (Noted May 15.)

PHILADELPHIA—Leas & MvVitty, 303 Vine street, advise that the contractor for a boiler plant to be erected for them at Langdon and Foulkrod streets is J. Temple Glenn, 524 Walnut street. Unit is to 16 x 39 feet.

POLK, PA.—State, department of property and supplies, B. E. Taylor secretary, Harrisburg, Pa., has recently closed bids for two stokers and necessary equipment and two boiler feed water meters to be installed at Polk state school. J. N. Chester Engineers, Clark building, Pittsburgh, are engineers for the project.

TEMPLETON, PA.—West Penn Power Co., West Penn building, Pittsburgh, has applied for a preliminary permit for construction of a 31,000-horsepower plant to be built in connection with federal dam No. 8, now being constructed across the Allegheny river near here.

New Jersey

PASSAIC, N. J.—DeForest Radio Co., A. B. Dumont chief engineer, 139 Franklin street, Jersey City, N. J., plans construction of a 2-story television transmitting station at a cost of about $40,000. Plans are private.

PERTH AMBOY, N. J.—Standard Underground Cable Co., Seventeenth and Penn streets, Pittsburgh, subsidiary of the General Cable Corp., has awarded contract to H. K. Ferguson Co., builders, Hanna building, Cleveland, for two 4-story plant buildings involving an expenditure of approximately $100,000.

SEWAREN, N. J.—Shell Eastern Petroleum Products Co. Inc., care Mr. Pearson, 122 East Forty-second street, New York, proposes to build a boiler house and power unit here. Preliminary plans are being drawn. H. S. Bell, Woolworth building, New York, is engineer.

Ohio

AKRON, O.—Goodyear Zeppelin Corp. is reported contemplating erection of a dock to be used for construction of zeppelins. Approximate cost $2,500,000.

CLEVELAND—River Smelting & Refining Co. dealer in foundry and mill residue, has a building permit for a small plant addition at 4195 Bradley road at an estimated cost of $15,000.

CLEVELAND—Steemoil Burner Co., recently organized by William S. Ferguston, 1900 Euclid avenue, will deal in new type of oil burner. Plant will possibly be established in about one year. Product probably will be manufactured at present by contract, according to advice.

CLEVELAND—Cleveland Co-Operative Stove Co., 2323 East Sixty-seventh street, K. F. Gill president, has purchased the business and assets of the Buckeye Incubator Co., Springfield, O., and will transfer operations of the subsidiary here, affording work for approximately 300 additional men.

CLEVELAND—Hill Clutch Machine & Foundry Co., 6400 Breakwater avenue, has work under way on a foundry addition estimated to cost approximately $15,000. Clyyde A. Prouty, 1463 Belle avenue, has the contract and Pangborn Corp., Hagerstown, Md., will install machinery. Unit will be used as sand-blasting department.

COLUMBUS, O.—Board of commissioners, Franklin county, will receive bids until July 16 for additions and alterations to power plant at Franklin county home. W. H. Tremaine, 28 Broad street, is architect.

DAYTON, O.—United Aircraft Products Inc., recently noted as successor to National Aircraft Products Co., has purchased holdings of the Dayton Automotive Wheel Co. at Linden and Huffman avenues, according to advice. Units consist of nine plant buildings covering two and one-half acres, allowing room for expansion of operations. Company manufactures aircraft metal parts. (Noted June 26.)

TOLEDO, O.—Plant of the Toledo Furniture Frame Co., 4080 Detroit avenue, was recently damaged by fire. Approximate loss, $7000.

Indiana

INDIANAPOLIS—Indianapolis Power & Light Co., 48 Monument circle, proposes to build a power substation, including eight 1200 horsepower boilers and two 35,000-kilowatt turbo generat-

ors, at South Harding street and White river. Estimated cost of entire project over $2,000,000.

KOKOMO, IND.—Kingston Products Corp., J. Paul Johnson president, has been consolidated with Kokomo Stamped Metal Co., manufacturer of skates and metal toys. Equipment of the latter will be moved to the plant of the Kingston company, manufacturer of brass and auto products, providing expansion of operations.

MUNCIE, IND.—Warner Gear Co., Ray P. Johnson Sr. president, 1106 East Seymour street, unit of Borg Warner Corp., 310 South Michigan avenue, Chicago, will build a plant unit on a tract recently purchased near here. One-story, 260 x 420-foot plant and 60 x 120-foot power house will be completed within about six weeks, with capacity of 2000 automobile transmission systems daily. About 500 men will be employed in the new unit.

Michigan

DEARBORN, MICH.—Ford Motor Co., care B. L. Brown, Coolidge highway, has let contract for construction of a 1-story top addition to a plant building on Miller road. Giffels & Vallet, 604 Marquette building, Detroit, are engineers.

GRAND RAPIDS, MICH.—Grand Rapids Metalcraft Corp., R. W. Hook president, 22 Commerce street southwest, will erect a new plant for its operations, for Metalcraft Heater Corp. and National Molding Co., subsidiaries. Plant will cost about $200,000 and expenditures for equipment will total approximately $100,000. Company manufactures window moldings, instrument boards, face plates and door panels for motor car bodies. Subsidiaries produce rolled steel products and metal heaters.

MUSKEGON, MICH.—Camshaft division of the former Jackson Motor Shaft Co., Jackson, Mich., will be moved to Muskegon for expansion of the Muskegon Motor Specialties Corp, Terrace street, with which it recently merged. Production of cam shafts, pistons, and other motor specialties at the Muskegon company's plant will be doubled.

PORTLAND, MICH.—City has awarded contract to Goff & Son for a hydroelectric power plant to be erected near the present municipal plant. (Noted May 22.)

Illinois

CHICAGO—Federal Pipe & Supply Co., 900 South Campbell avenue, has building permit to erect a 2-story warehouse, 41 x 313 feet, at an estimated cost of $16,000. G. E. Baumeister, Railway Exchange building, is architect.

CHICAGO—Three hangar units at municipal airport, belonging to Universal Air Lines, 228 North LaSalle street, and other air transport companies, were recently destroyed by fire. Los was over $2,000,000.

CHICAGO—Wisconsin Steel Co., 2701 East 106th street, has two building permits: one for the construction of a 1-story, 20 x 70-foot plant unit on East 110th street to cost approximately $10,000; other for 1-story plant unit, 143 x 168 feet, on East 108th street, to cost about $185,000. K. Batzeman, 2701 East 106th street, is architect.

CHICAGO—Jones Superior Machine Co., 1258 North avenue, has a building permit for the construction of a 1-story, 70 x 125 feet, addition to its plant. A. E. Strobel, 192 North Clark street, is architect. Company manufactures woodworking machinery. General contract has been awarded to McKeown Bros. Co., 112 West Adams street, Chicago.

EAST ST. LOUIS, ILL.—American Steel Foundry Co., maker of steel castings, will build a 1-story, 100 x 125-foot plant addition at an estimated cost of $25,000, on Gaty street.

GENOA, ILL.—City commission and J. E. Huffman, Madison, Wis., are inspecting sites for a plant here. Company would manufacture dies and novelties, possibly locating in the old plant of the Selz-Schwab Shoe Co.

GLENWOOD, ILL.—Glenwood manual training school will build a 2-story administration building at a cost of about $100,000. Contract has been awarded.

Southern States

BALTIMORE—City has awarded contract to Consolidated Engineering Co., 20 East Franklin street, for the construction of a 46 x 129-foot pumping station in Druid Hill park. Cost will be about $130,000.

PENSACOLA, FLA.—Pensacola Metal Aircraft Corp., manufacturer of flying boats, is remodeling buildings of the Pensacola Shipbuilding Co., according to advice. Materials and special machines will be purchased. Planes will be constructed of dural. (Noted June 26.)

BIRMINGHAM, ALA.—Goslin Birmingham Mfg. Co., manufacturer of sugar and special machinery, recently acquired by the Whiting Corp., Chicago, is making extensions to its foundry and is said to have awarded some contracts.

BIRMINGHAM, ALA.—Birmingham Auto & Machine Co., Second avenue south and Twenty-fourth street, is reported to be in the market for machinery for manufacture of hammer handles, and other articles.

NEW ORLEANS—Ford Motor Co., Fordson, Mich., is reported planning expansion of its body plant here at an approximate cost of $500,000. Local plant is in St. Bernard parish.

NEW ORLEANS—Wedell-Williams Air Service has let contract to Arch Construction Co., 2126 Poland street, for a hangar, 100 x 100 feet. (Noted April 17.)

LOUISVILLE, KY.—Tube Turns Inc., Shelby street and Goss avenue, has awarded contract to Greathouse Bros., 654 South Ninth street, for construction of a plant extension which will increase floor space 50 per cent. Machinery will be purchased for making seamless fittings for pipe welding. (Noted June 26.)

Missouri

ST. LOUIS—Federal Brilliant Co., 3531 Washington avenue, manufacturer of metal signs, has awarded contract for a 4-story plant, 33 x 57 feet, to H. O. Hirsch & Co., Wainright building.

ST. LOUIS—Scott field will be the site of new United States dirigible station. Committee on military affairs, Washington, D. C., has authorized $1,206,500 for hangar units and other buildings. Cost of various units includes: field shops, $122,000; depot shops, $200,000; headquarters and operations building, $80,000; gas plant, machine shop and chemical storage building, $50,000.

Oklahoma

OKLAHOMA CITY, OKLA.—Oklahoma Gas & Electric Co. will construct a warehouse and repair shop building at Broadway and Chickasaw streets for servicing and repair of heavy electrical equipment.

PONCA CITY, OKLA.—Empire Oil & Refining Co. plans improvements to its refinery here, including enlargement of boiler house and machine shop. R. R. Mills is general superintendent.

TULSA, OKLA.—Missouri Portland Cement Co., 1010 Pine street, St. Louis, has plans for construction of a large cement plant, which will include machine shops. P. C. Blaise is general superintendent.

Texas

FT. WORTH, TEX.—Fort Worth Tank & Culvert Co., M. A. Gay president, recently organized, has completed a shop building, 50 x 100 feet, at 1100 North Commerce street.

HOUSTON, TEX.—Atlas Engineering Works, Jack Barker manager, is erecting a shop building, 40 x 60 feet, at 5200 Navigation boulevard.

HOUSTON, TEX. — Marine Iron Works, R. A. Horne manager, will build a boiler fabricating shop addition, 50 x 52 feet.

HOUSTON, TEX.—Sanitary Appliance Co. Inc., 308 Hughes street, is building a shop addition, 50 x 100 feet, for fabrication of sheet metal products.

Wisconsin

MENASHA, WIS.—Northwestern Electrotype Co., Hewitt avenue, Neenah, Wis., will build a plant here at a cost of approximately $20,000, at Garfield avenue and Washington street. Auler, Jensen & Brown, Oshkosh, Wis., architects, will take bids soon.

SHEBOYGAN, WIS.—Plant of the American Parlor Frame Co. was recently damaged by fire. Estimated loss, $10,000.

Minnesota

COLERAINE, MINN.—Caniesto Cliffs Iron Mining Co. has awarded contract for the construction of mining plant units to cost $65,000. Included is a 1-story, 63 x 197-foot machine shop.

DULUTH—Plant of the Acme Foundry Co., Cumming avenue and Second street, was recently damaged by fire to the extent of $1000.

MINNEAPOLIS.—Northern States Power Co., 15 South Fifth street, will build additional power units at its Riverside stations. One 35,000-kilowatt turbine, condensing equipment, boilers, and other auxiliaries will be installed.

MINNEAPOLIS—Baker Iron Co., East Twenty-second street and Hiawatha avenue, manufacturer of ornamental iron and bronze, advises through E. P. Baker that its new plant will be 60 x 142 feet. Company is still in the market for several items of machinery. (Noted June 26.)

Iowa

LAKE MILLS, IOWA—City council has awarded contract for construction of municipal power plant, with distribution system and equipment at an approximate cost of $100,000.

Kansas

CLAY CENTER, KANS.—Miller-Maid Cook Ware Co., 1341 Montgail street, Kansas City, Mo., is reported contemplating construction of a 1-story plant and office building here. Company makes aluminum kitchen ware.

Colorado

DENVER—Griffin Wheel Co., 410 North Michigan avenue, Chicago, has a building permit for fire repairs at its branch plant on West Evans avenue. Company manufactures car wheels.

Utah

BINGHAM CANYON, UTAH.—Jordan school district of Sandy, near here, plans construction of a high school, including shop building, at a cost of about $350,000. Scott & Welch, Dooley building, Salt Lake City, Utah, have sketches.

Pacific Coast

SEATTLE—L. O. Breppe is having a 40 x 100-foot addition built for his iron works at 1526 West Forty-sixth street.

SEATTLE—Board of education plans erection of a shop addition at Broadway high school at an estimated cost of $50,000. F. A. Naramore, 810 Dexter street, is architect.

PORTLAND, OREG.—Crane Co., 160 Fourteenth street north, advises its new warehouse at Twelfth and Irving streets will be open about Sept. 1. A monorail transfer crane will be installed. (Noted June 19.)

ANAHEIM, CALIF.—Elliott Welding & Mfg. Co. Inc., R. E. Elliott manager, is erecting a plant addition for the construction of metal tanks.

BURBANK, CALIF.—Garages, mills and shops are among the units proposed to be built for a new system of film studios for First National Productions Corp. here. Total cost will be over $2,500,000. J. Agnew, architectural department of owner, has plans.

LOS ANGELES—Active Sheet Metal Co., 1315 West Washington street, has purchased a site at 683 Santa Fe avenue.

LOS ANGELES—Industrial Inventions Mfg. Co., care James W. Martinett, has leased premises at 1626 South Los Angeles street. Company manufactures ovens and other metal products.

LOS ANGELES—Gogle Tool Co. will locate plant operations temporarily at 5316 San Pablo avenue. Company manufactures small tools used chiefly in automobile and airplane trades.

LOS ANGELES—Tonnage Transportation Co. Ltd., has purchased a tract covering 42,162 square feet at Medford avenue and Bonnie Beach place and will erect a plant for the manufacture of monorail transportation equipment.

LOS ANGELES—W. W. Hodkinson, 123 East Windsor street, Glendale, Calif., will head a new airplane manufacturing plant to be built in or near here. Negotiations for taking over the plant of a local airplane concern are reported under way. New company will manufacture approved type planes recently developed by the Valley Mfg. Co. in its laboratory, 1729 Standard avenue, Glendale.

OAKLAND, CALIF.—Barret Mfg. Co., manufacturer of radio equipment, has leased 1500 square feet of space at 3714 San Pablo avenue.

SACRAMENTO, CALIF.—National Engine & Boat Co., Ira Hand secretary, 420 Lexington avenue, New York, is reported to be inspecting sites here for the construction of a plant.

SAN DIEGO, CALIF.—Board of education plans construction of a 1-story shop building at Herbert Hoover high school. T. C. Kistner & Co., 816 West Fifth street, Los Angeles, are architects.

Dominion of Canada

VANCOUVER, B. C.—Crossman Electrical Machinery Co., 5062 Alexander street, has awarded general contract to the Dominion Construction Co., 509 Richards street, for construction of a 2-story, 50 x 67-foot building. Cost is estimated at $11,000.

CHURCHILL, MAN.—J. W. Pugsley, secretary department of railways and canals, will receive bids until July 10 for equipment for generator room and boiler house of power plant. A. E. Dubuc, care department, is chief engineer.

GALT, ONT.—Public Utilities commission, A. B. Scott secretary, is receiving bids on a 400 or 500 horsepower Diesel engine auxiliary power unit for power plant. Estimated cost, $30,000.

TORONTO, ONT.—City, care B. S. Wemp, chairman of the board of control, will receive bids until June 30 for one 5,760,000-gallon centrifugal pump and motor.

Recent Incorporations

CHICAGO—Shockless Drive Corp., 108 North Jefferson street, has been incorporated with 1000 no par shares by Zane, Morse & Norman, 111 West Monroe street, to deal in machinery and mechanical devices.

CHICAGO—International Engineering Corp., 105 West Adams street, has been incorporated with 2000 no par shares by Ralph Horween, 209 South LaSalle street, to deal in mechanical equipment and devices.

ELKHART, IND.—Artility Metal & Boiler Works Inc. has been incorporated with 1000 no par shares by J. A. Warstler, 314 LaSalle street, to engage in toolmaking and metalworking.

ELKHART, Ind.—Artility Metal Products Inc. has been incorporated with 3000 no par shares by Verne G. Cawley, 312 Monger building, to make metal products.

NEW ORLEANS—Murphy Iron & Boiler Works has been incorporated with $25,000 capital by William J. Murphy, 1322 Felicity avenue, to operate a boiler works.

EAST BRIDGEWATER, MASS.—Vincent Mfg. Co. has been incorporated with 250 no par shares by Eugene T. Vincent, 93 Massachusetts avenue, Boston, to deal in automatic heating devices.

DETROIT—Chance Processed Steel Co. has been incorporated with $10,000 by Charles T. Chance, 300 Whitmore road, to manufacture and deal in metal products.

DETROIT—Nu Lo Drive Inc. has been incorporated with 50,000 no par shares by Cortland K. Larned, 3063 Penobscot building, to manufacture and sell machinery, machinery products and automotive equipment.

OWOSSO, MICH.—Owosso Airport has been incorporated with 5000 no par shares by Robert E. Wilcox, 223

Michigan avenue, to operate an airport.

CAMDEN, N. J.—Mechanical Products Corp. has been incorporated with $500,000 capital by Williamson & Williamson, 1321 Arch street, Philadelphia, to manufacture mechanical devices.

CAMDEN, N. J.—Garfield Smelting Co. Inc. has been incorporated with $100,000 preferred stock and 500 no par shares by George H. B. Martin and J. Vernon Pimm, to smelt and refine metals.

PITMAN, N. J.—Dail Mfg. Co. has been incorporated with $25,000 capital by Corporation Trust Co., Fidelity building, Philadelphia, to manufacture electrical equipment.

BROOKLYN, N. Y.—Inlaid Metal Store Front Co. has been incorporated with $20,000 capital by A. J. Smith, 27 Green street, to make metal store fronts.

NEW YORK—P. & J. Die Co. has been incorporated with $35,000 capital by A. Davis, 291 Broadway, to deal in metals.

NEW YORK—Avon Mfg. Co. has been incorporated with 200 common shares by the company, 57 Walker street, to deal in metal goods.

NEW YORK—Otto Partenheimer has been incorporated with 60 common shares by Keeler & Harrison, 255 Broadway, to make metal products.

NEW YORK—Greenwood Brass and Iron Foundry has been incorporated with $50,000 capital by Nathan Bardach, 5 Beekman street, to operate a foundry.

NEW YORK—Mark Sheet Metal & Contracting Co. has been incorporated with $20,000 capital by Grossman & Gitter, 47 West Thirty-fourth street, to engage in contracting and dealing in sheet metal.

NIAGARA FALLS, N. Y.—Niagara Stoker Corp. has been incorporated with $10,000 by J. O. Chapin to deal in heating apparatus.

CLEVELAND — Efficient Heater Manufacturing Co. has been incorporated with 750 no par shares by Frank Leiter, Engineers building, to manufacture heaters.

FORT WORTH, TEX.—Oil Field Engineering Corp. has been incorporated with 1000 no par shares by John R. Long, 740 West Rio Grande, to manufacture oil field tools.

HOUSTON, TEX.—Page Steel & Wire Co. of Texas has been incorporated with $10,000 capital by Wilmot F. Wheeler and Walter B. Lashar, care Page Steel & Wire Co., 644 Union arcade, Pittsburgh, to manufacture and sell metal products.

TULSA, TEX.—Hoffman Ball Valve Co. has been incorporated with $10,000 capital by Ben P. Hoffman.

BELLINGHAM, WASH.—International Mercury Inc. has been incorporated with $100,000 capital by J. F. Shelton to engage in metalliferous mining.

EVERETT, WASH.—American Boiler Works Inc. has been incorporated with $10,000 capital by A. M. Vierhus, attorney.

SEATTLE—Seattle Foundries has been incorporated with $20,000 capital by J. J. Schwab and E. H. Flick, 913 Hoge building.

WINNIPEG, MAN.—Northwest Aero Marine Ltd. has been incorporated with $100,000 and 15,000 no par shares by Arthur E. Johnson and Roderick K. Finlayson, to manufacture and deal in aeroplane and hydroplanes.

STRATFORD, ONT. — Automatic Products Co. of Canada Ltd. has been incorporated with $100,000 capital stock by James M. Riddell, John Fraser and Isabel Brintnell, to manufacture and deal in engines, machines and automatic screw machine products.

TORONTO, ONT.—Davenport Construction Co. Ltd. has been incorporated with $40,000 capital by Harvey Obee, 45 Glenview street, to engage in the business of constructor.

TORONTO, ONT.—General Automatic Lock Nut Corporation Ltd., has been incorporated with $1000 by Anna McNama, 81 Isabella street, to manufacture and deal in nuts, bolts, screws, and patent lock nuts.

TORONTO, ONT.—Hiebert Motor Engineering Co. Ltd. has been incorporated with 200,000 no par shares by Erdman R. Hiebert, 566 Millwood road, to manufacture and deal in hydraulic clutches and accessories.

TORONTO, ONT.—General Dry Batteries of Canada Ltd. has been incorporated with $100,000 and 10,000 no par shares by John G. Collinson, 330 Bay street, to manufacture and deal in batteries, generators and dynamos.

TORONTO, ONT.—Continental Transformers Ltd. has been incorporated with $50,000 and 50,000 no par shares capital by Earl P. Groh, attorney, 167 Young street, to manufacture and deal in electrical machinery, apparatus and appliances.

MONTREAL, QUE. — Electrical Moving Signs Ltd. has been incorporated with $50,000 and 50,000 no par shares by Benjamin Robinson, 620 Cathcart street, to manufacture and deal in electrical appliances and accessories.

New Trade Publications

SPEED REDUCERS—Philadelphia Gear Works, 1129 Vine street, Philadelphia, has issued a catalog of its speed reducing units, 120 pages, illustrated.

CRANES AND DERRICKS—Bedford Foundry & Machine Co. Inc., Bedford, Ind., in a bulletin shows illustrations of various types of its cranes and derricks in actual use for numerous industrial purposes.

THE ELEMENTS—P. C. Kullman & Co., 110 Nassau street, New York, has compiled for free distribution a list of 92 elements with atomic numbers, symbols, atomic weights, melting points and date of discovery. It is a compact listing of the basis of chemistry and industry.

REFRACTORIES—Corundite Refractories Inc., Massillon, O., tells the story of its refractory products in a booklet now being distributed. The company is in its forty-ninth year and its output includes a wide range from low to high grade. The booklet is in reality a catalog of its products.

LIFTING DEVICES—Ambold Machine Tool Corp., 50 Church street, New York, features its junior double-acting hoist in a current bulletin, with some mention of its other electrical lifting devices with capacities up to 10 tons. The junior hoist is illustrated and described and its advantages stated.

INGOT IRON—American Rolling Mill Co., Middletown, O., pressing its campaign to broaden use of its product, has issued two leaflets, one dealing with its sheets for refrigerator cars and the other for locomotive jacket sheets. Each is illustrated and contains data of interest for builders of these classes of railroad equipment.

LUBRICATION—Roberts Lubrication Equipment Co. Inc., 705 Wabash building, Pittsburgh, describes in a booklet its provision for meeting the varied problems of lubricating machinery in steel mills by its centralized systems of positive pressure application. Equipment is illustrated and the text describes methods of applying lubricant to various kinds of mill machinery. Problems in lubrication are discussed and solutions suggested.

GRINDING WHEELS—Grinding wheels designed for use on cemented tungsten carbide form the subject of a booklet by the Carborundum Co., Niagara Falls, N. Y. Characteristics of tungsten carbide are discussed, the grinding problem stated and the proper makeup of abrasive wheels considered. Photomicrographs show results of use of various abrasives. The booklet is practically a manual of procedure for grinding this material.